

MARTIN SCHWEIGER

# THE 4X4 INNOVATION STRATEGY

VERSION 1.1



**HOW TO TURBOCHARGE YOUR INVENTIONS  
(AND MAKE A SUCCESSFUL PRODUCT)**





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# **The 4x4 Innovation Strategy**

## **How to Turbocharge your Inventions**

### **(And Make a Successful Product)**

This book starts where other books about innovation end.

Having seen more than one hundred bankruptcies from the inside and more than six hundred failed product ideas over 27 years, Martin Schweiger takes the reader by the hand and walks him down to the morgue. By way of example, he dissects dead innovation and derives a simple yet efficient structure that helps you better understand what made these casualties happen. Starting from there, it becomes clear that—as is often in life—an organized defense line is more important than a bold center forward.

Entrepreneurs receive a big picture model to easily communicate what they are planning to do, aligning their technicians and managers to perform better in new product development. Investors get a more transparent picture of what they are investing in, what they can possibly expect in the near future, and when is a good time to exit their investment.

This book also helps people who advise start-up companies in business matters, such as general lawyers, accountants, and marketing experts. It is Martin Schweiger's calling to produce materials that guide these support professionals through the minefields that come with innovation. This book will also help them to better cooperate with patent attorneys, who are the trained hands-on specialists in intellectual property law.

This book is for:

- Inventors who want to commercialize their innovative ideas, and who believe that a successful business is not just about the products themselves
- Legal professionals who want to help their own clients when asked for advice outside their own domains of expertise

- Innovation Managers who want to help their R&D teams to stay on track and to meet their KPIs
- Young and bright people who want to understand how intellectual property, innovation strategy and entrepreneurship fit together

This book can be found in three versions:

- **The Shotgun Edition**, a summary condensing the most important points for time-strapped readers. It comes in the form of a Kindle ebook for easy reading on a handheld device. Like a shotgun, this edition intends to shoot in the general right direction with hopes of hitting the target.
- **The Rifle Edition**, a comprehensive business book meant for professionals who work with inventors, be they accountants, lawyers, investors, bureaucrats, or even the general public. It comes in the form of a PDF. Like a rifle, this edition is more powerful than a shotgun, and can go a further distance in explaining these complex concepts. You also get a one-month trial ordinary membership access to Martin Schweiger's personal website, with training courses for intellectual property, innovation strategy and business-related topics.
- **The Scope Edition**, a value-added premium hardcover version intended for innovators and their managers. It comes with a one-month trial premium membership access to a section of Martin Schweiger's personal website that is hidden from the public. There you can get personalized information when you need it. Like a scope rifle, it is a powerful, highly-focused tool to further advance and promote your innovation in depth.



What you hold in your hand is the Rifle Edition for professionals. Each part is cross-referenced with Martin Schweiger's online portal at [www.ip-lawyer-tools.com](http://www.ip-lawyer-tools.com) where there is supplementary material to support your understanding. As this is dynamic material, Martin Schweiger expects regular updates of his books. In the meantime, please join our online community!



This book is dedicated to Dr. Gary North,  
scholar, businessman, author, publisher, gold coin  
salesman, ex-employee of the sovereign state of the US  
Congress, biblical economist, online homeschool curricu-  
lum developer, marketer, counselor, cancer survivor, father  
of four, mentor, teacher, and child of God.



## **Part A: Innovation**

### **And the Transcendent Power Behind Innovation**

There is an innovator inside some of us. Not in everyone, but only a few selected people.

It is my firm belief that you are either born an innovator or you will never become one. The ability to innovate is inseparable from your nature.

Innovation is a deeply human instinct that cannot be analyzed or automated. At its most fundamental, innovation is a capacity for imagination, inventiveness, inspiration...and the ability to combine these powers to create new technologies.

Because most people do not have it, innovation can seem a mystery; a realm of genius or chance, accessible only by a lucky few. We celebrate famous innovators and inventors for how their ideas have changed our world.

But this is just one side of the coin. Being an innovative person often is a curse, and not a blessing. Many innovators end up in bankruptcy and depression.

The difficulty lies in developing your fragile new ideas into viable, commercially-successful technologies. Because innovation, if done wrongly, has drastic consequences.

The good news is that there is a natural structure governing the field of innovation.

It is my calling to shed light on this structure. This is my ultimate reason for writing this book for you, a professional who works with inventors. Because I want innovators to have a guide map for bringing out the best in themselves, instead of stubbornly fighting against nature.

Visit [www.bit.ly/4x4-innovation](http://www.bit.ly/4x4-innovation) for Part A updates and discussion forums.

# **Tactics, Strategy, or Wisdom. Success or Failure.**

## **Winning the Innovation, IP and Business Game**

### **Introduction**

It is a big jungle out there, in the world of entrepreneurship, innovation, and setting up a business.

As an inventor, entrepreneur or legal professional, you cannot afford to be ignorant. Successful commercialization of an idea requires applied proficiency at the intersection of innovation, intellectual property (IP) and commercial best practices.

**For inventors and entrepreneurs, ideas are easy, but getting to market successfully is a marathon with a high failure rate.**

- *The 4x4 Innovation Strategy* teaches you to hedge your risk through applying effective innovation strategy so that your business does not die before your product is out.
- It gives you the background and resources to know what you do not know about intellectual property, and to make decisions about paying for legal advice.
- It shows you, through various examples and models, the blind spots that every aspiring inventor should be wary of.

**For professionals who work with inventors, you risk getting silo-ed in your area of expertise, and ignoring the bigger business and technology picture.**

- *The 4x4 Innovation Strategy* helps you to offer relevant legal and business advice when inventors come to you with a great product idea.

- It gives you interdisciplinary expertise, because just being an expert in your field is not good enough these days.
- It takes you through the basics of IP in the context of technology product development; useful if you are not a patent attorney and want to know how IP is successfully done.

I have walked around this jungle, and seen the problem from different angles. While success is never guaranteed, you will find important concepts explained in a unified and useful way.

## **Tactics, Strategy, and Wisdom**

You may have seen the term “Innovation Strategy” in the title of this book.

This title comes after years of hindsight. I have not seen a single book about innovation that does not jump straight to R&D tactics or to patent tactics, often right after Chapter 1. In fact, people often use the terms “R&D” and “patent” as synonyms for “innovation”. Many even measure the innovation potential of a company or an entire country as the number of patent applications filed over a period of time.

That is not a good way of measuring innovative power. Years ago as a young engineer, I went deep into R&D. And I had many good ideas. And because I wanted to know more about making my own inventions successful, I became a patent attorney.

After practising in the area of patents for almost three decades, I realized that my initial approach to innovation was dead wrong. Over time, I even learned to like intellectual property, and found out that patents are only one of the 25 tools in a patent attorney’s toolbox. But I also found out

that patent tactics is only one of four strategic areas that innovators need to cover in order to be successful.

Now that half my life has passed, I begin to see the entire picture. There is much more to consider in the area of innovation.

## **A Natural Five-Layer Structure**

I have discovered a natural five-layer structure in innovation, which this book mirrors in its five parts A to E.

A complementary structure, describing five levels of insight, can be found in the minds (not mindsets) of innovators. Simply put, the goal is to move up from zero insight to full insight, which crests in achieving wisdom in innovation.

To achieve a higher level of insight, you need to understand the differences between knowledge and wisdom. Knowledge tries to game the system. Wisdom cooperates with the principles of the system. Knowledge is interested in what you can get from an innovative idea. Wisdom cares about what seed you sow in order to derive income from it.

**Insight Level 1: Robot.** I am only including this for the sake of completeness. Minds at this level have no insight, nor knowledge, and you can forget about wisdom. If you are at this level, you just react to what happens. You are told what to do, when to do it, and how to do it. You function like a robot with no independent thought.

**Insight Level 2: Basic Facts.** The lowest level of insight is knowledge. This means possessing the basic facts. For a patent attorney, it would be knowing facts, such as, the Paris Convention deadline for claiming priority of a foreign filing date is 12 months for patent applications. For everyone, you would know standard facts like  $4 \times 4 = 16$ .

**Insight Level 3: Tactics.** These are techniques. Plans based on knowl-



edge. Methods, shortcuts, and ways to get things done. If you want to draft a good patent application, get a checklist from us on the ten most serious pitfalls to avoid—that is a tactic. Other examples of tactics include filing a patent application in a certain country, or adding a specific claim category to your patent application that enhances the scope of protection of the later granted patent.

**Insight Level 4: Strategy.** This is the overarching plan, the approach. Strategy is knowing that in innovation, there is an order or hierarchy of what to do, and when to do it. Strategy is defining your innovation in terms of what really matters (“I can solve this pain and there are people who would pay for solving it”), instead of the assets you have (“I have a patent portfolio”).

**Insight Level 5: Wisdom.** This is the highest level of insight. Wisdom sees the highest purpose in everything you do. Wisdom does not let small things dictate big things. Wisdom is being able to see the reason why you are doing innovation, and how to practically align it with the overall goals of your company.

In innovation, the level of wisdom is difficult to reach. While I do not think that each and every innovator can learn to achieve wisdom in innovation, I do know that many innovators carry the seed for wisdom within themselves.

This book is a guide for people who work with innovators, to help them advance to the level of wisdom.

What follows next are some fundamental attitudes and assumptions about innovation, that directly affect the chances of success or failure in innovation.

## Success and Failure

### Start-Up Failure is Common

While my clients are usually big MNCs or SMEs, I have a soft spot for start-ups. I have always set aside time for very small companies, because I know I can help them.

Over 27 years, I have seen about 100 bankruptcies from the inside. Why do I see bankruptcies from the inside? Because when a company with Intellectual Property (IP) goes bankrupt, the bankruptcy liquidator always wants to know, “What can we get for selling these patents, trademarks, and Internet domains?” I would then help him to sell the IP. When everything is over, we would sit down together to have a nice meal, and he would usually tell me why this particular start-up went bankrupt. So yes, I am familiar with bankruptcy.

I have also seen about 600 failed products. How do I know a product has failed? Because if inventors have filed patents for their products with my firm, and suddenly send an email along the lines of, “Hey, I don’t want to pay the renewal fees for this patent,” it means that they are giving up their patents. If I ask what the problem was, the inventor always says, “It didn’t work out.”

Being curious, I always need to find out why it did not work out. The answers? Yes, there is a patent, but nothing has been done to bring the invention to the market. Or, there is a sophisticated prototype but “it still has too many bugs”. Or perhaps there is zero knowledge about competitors, and also nothing known about their competing products. And Freedom-to-Operate (FTO) is a mysterious loanword. And so on. In short, a great many reasons why the product or even the start-up failed.

### The Problem With “Fail Fast”

Silicon Valley’s famous phrase “fail fast” is used to describe how start-ups should celebrate and embrace failure. Other versions of these include “fail fast and fail often”, “fail forward” or “fail better”.

It basically says that entrepreneurs need to throw themselves into their ventures, no holds barred, and achieve some spectacular failures before they get a success.

This is an attractive point of view. It is also conventional start-up thinking—a popular management buzzword that both inventors and investors like to use to impress the media.

I personally think it is stupid to glamorize failure. Here are some issues with “fail fast”:

- It is a fantasy, and not one created by actual inventors. It is bad advice, based on various myths about entrepreneurship and innovation.
- It encourages overly-linear thinking. You narrowly focus all your energies on the development of a product. You cannot see the forest for the trees. You get tunnel vision.
- It makes you give up too easily. This might work for young or inexperienced entrepreneurs who take advantage of rich VC funds. It does not work for real products created by real inventors, with actual market value.
- It creates a frantic, short-term company culture. Employees are focused on the technical aspect of product achievement. There are few other common visions.
- As an engineer by training, and having worked as a military engineer, I am trained to design systems against failure. A system failure can be a cause of death. The word “failure” therefore does not sound attractive to me.
- And worst, *it encourages bankruptcy.*

## **Failure by Bankruptcy is The End**

Failure in itself is neutral. But bankruptcy means a total loss of control. Game over. You cannot live to fight another day.

If you were a start-up founder, which would you choose?

Fall in love with your single great idea. Use all your energy and resources to develop it. Go out in a blaze of glory, with nothing left. But at least you are secure in the knowledge that you tried your best. (Reality: it is usually not glorious. More likely, you will be exhausted, depressed, uncertain, and your life in pieces.)

Or, have a hundred parallel ideas. Because you cannot focus on all of them at the same time, you pick one that seems viable.

The best option is to pick an idea that is already out there, that is used by someone else, but is not yet put to practice in a way that you like. So it does not yet work for the market segment that you are aiming at. Test this idea, tweak it, and allow small controlled failures from negative market responses. If the idea does not seem to work at all, cut your loss, and try the next best idea. Iterate the process, and learn from your mistakes. Do it as low-risk as possible, and avoid bankruptcy at all costs! Once your company starts to thrive, you can try more than one idea in parallel, provided that they are related to each other. You will need a manager to coordinate your innovative efforts once you reach that state.

## **Avoid Bankruptcy by Cutting Your Losses Early**

This approach, which I call “parallel processing until cutting your losses” has the following benefits:

- Less risk. Because there are clear early-stage indicators for success or failure, you can choose to cut your losses early.
- Failure is controlled. Because you can cut your losses, you can go on to pursue the next idea. The failure that occurs is the controlled failure

of a product or invention, not of your entire company or business.

- Allows multiple ideas. In any tech company, a good CTO should always have a whole portfolio of product ideas, in case the current one fails while testing the market response. This redundancy reduces the business risk.
- The company is actually sustainable. Even if a product fails, the company lives. Employees are still employed, and their knowledge and training are still available. Company culture and expertise is best built over the long-term.
- More creativity, flexibility, and room for dissent. Tunnel vision across a company occurs when everyone blindly follows the inventor. If people are not fixated on a single product goal or single source of authority, the company can have diverse viewpoints.
- Most importantly, *this approach is strategic*. As a start-up with few resources, you cannot afford to develop more than one idea at a time. This constraint forces you to be very strategic in all your business decisions.

## Success Needs the Right Definition

You may not yet agree with my strategy, but let me tell you from my own experience over several decades, that an engineering approach to defining “success” does not work for your personal life.

“Success” is not about setting goals and then achieving them. Before achieving a goal, there may be one hundred attempts that fail. If you choose to define your identity by whether or not you achieve your goals, you will probably end up with depression because of your many failures.

I have so far seen only one definition of success that resonates with my own life experience:

*Success is peace of mind that is the direct result of self-satisfaction in knowing you did your best to become the best that you are capable of becoming.*

**John Wooden, Basketball Coach (1910 - 2010)**

Let John Wooden's definition sink in for a minute.

Success is a state of mind and not a tangible result. It is the mental state of being at peace. And that peace comes not from your environment, but from your inner self-satisfaction. That self-satisfaction goes back to a tangible fact, namely the knowledge that you did your best, within the limitations of your own life. And the knowledge that you came very close to what you are ultimately capable of becoming.

As a successful innovator, you will have not only applied your technical knowledge to your idea. You will have done everything else necessary to bring it to market. You will have applied the right strategy and maximized your resources in all areas that contribute to market entry. The market may not have responded as you had hoped it would. You then found out why this was the case, but you could not see how this could have been changed. Now, the right decision is to stop banging against a closed door. You can try again at a later time. You then switch your focus to another one of your many innovative ideas. So that you can live in peace. And that, to me, is considered success in innovating.

As an aside, and for the sake of completeness, there is another aspect of success that, thankfully, seldom affects inventors even though it might happen to them. This is the confusion between indicators of success, and actual success.

An example: we are told that we have to work hard, save money, invest it, and buy expensive watches and cars and own a shiny house in a good location. Why? Because expensive consumer goods and expensive real estate indicate wealth and power. A young man may substitute these success indicators—an expensive lifestyle—for success. He works more, and he

does not care whether he finds his calling in life. But he gets richer. Then he starts cheating. He gets even richer. He is seduced by these success indicators. This is why people who are internally driven to succeed often wind up in old age with a feeling of emptiness. All that wealth means nothing. This is the tragedy of pursuing success indicators instead of actual success.

Older inventors seldom suffer from this pursuit and accumulation of wealth. Rather, they suffer from stubbornly pursuing their inventions without giving up when it is time to do so, and this is why they often end up in poverty and becoming a burden for their loved ones.

### **Part of Success is Staying Alive Despite Failed Products**

As an inventor myself, I am personally familiar with failed products. I have created over a hundred inventions, and filed patent applications for several dozens. But many of my inventions did not work out in the market. Nobody wanted to pay money for them. So I abandoned the patent applications early, usually before they were granted. I cut my losses by not spending any more money and time on failed inventions.

A failed invention does not have to mean bankruptcy. I should know, because I am still here, running a successful company that has little to do with my failed inventions.

*The difference between a successful company and an unsuccessful company is that the former has a high frequency of innovation, but does not get killed by its innovation.*

Failed products are common. Many innovations do not make it to market. The trick is in *recognizing the looming failure early enough so that you can cut off funding and free it up for other critical business needs*. The important thing always is how to prioritize your resources

such that you focus on what is a tangible success.

What happens when you do not do this? What if your priorities are all wrong, and you have zero strategy, no clue about patents, and poor business instincts?

Here is a cautionary tale:

## **An Inventor's Story**

I will always remember Gene. In fact, it is for people like Gene that I am writing this book.

### **A Brilliant Inventor With a World-Changing Product**

Gene is a brilliant inventor, and one day, after years of effort, he succeeded in making something extraordinary.

It was a control device which would give deep data insights into electric power generation and transmission, for multiple energy sources: solar power, hydro power, wind power, heat conversion power, storage elements, transmission lines, you name it.

It was scalable—it could be miniaturized to fit into a smartwatch, installed into a home electrical system, or even expanded to cover a full electrical city grid. It could be used for numerous products and industries, and it would finally solve the problem of optimizing the distribution of electrical energy to where it is actually needed. And the best was that it would pay for itself by AI arbitrage trading if deployed on a medium to large scale system.

It solved a problem, it was original and innovative, it could disrupt an entire industry, it had potential applications for energy products and markets all around the world.

Gene was really excited. He had invented a great product! Gene is from the energy industry, so he would know. He himself could not wait to use this product and install it in every electrical circuit, and of course so would everyone else. His disruptive invention would soon be the standard in



electrical systems everywhere.

Or so he thought.

## **Gene Becomes an Entrepreneur**

Gene had always been an efficient, creative engineer, an expert in his field. He did not like to be managed by business people who did not understand his work, and he chafed at the restrictions of his job.

As a longtime inventor-engineer who finally has a successful working device, he felt more than ready to jump into a new phase of life as an entrepreneur. Surely, with his expertise, brilliance, motivation and resources, he could do better than the average businessman?

Now, more about Gene. At that time, he was 49 years old. He was married with two children aged 12 and 14, but had very comfortable retirement savings from his high-paying job. Coincidentally, his company was undergoing a restructuring, and offered him a generous job severance package that was twice his yearly salary, tax-free.

It seemed like the right time. And maybe it was.

The thing is, all decisions are calculated risks. I am not telling you not to pursue your dreams, but if you have a lot to lose, you need to be even more careful with your innovation strategy and with your mindset as an entrepreneur. This goes beyond being just an inventor—all things we talk about in this book.

Gene's risks were known, and given the huge potential upside of his product, perhaps he would have been a great success. He convinced his family and friends to contribute seed money. He found himself an investor and a patent attorney. He started a company, and recruited smart people to work for him. With the influx of easy cash and legal advice, he thought he was all set.

But over the next five years, Gene proceeded to make just about every mistake possible.

## Gene's Mistakes

Let's list them down point by point.

- **As a perfectionist engineer, Gene could never finish his R&D.** There was always one more important bug that needed to be fixed, before Gene would even consider switching to serious sales. He had too much of a Technician mindset.
- **Gene lived in a dream world where the rules did not apply to him.** Gene was not interested in whether his plans were possible. To him, the obvious advantages of his invention would convince lawmakers to adapt their regulations to allow his products into the market. He was aware of some competitors, mostly huge MNCs, that were working in the same technical area, but he never cared much about their IP portfolios. There was always time to deal with it later.
- **Gene never considered sales important, and tried to develop a finished product without getting any market response.** He was sure that his product was so good that a salesman was not needed. He often quoted Ralph Waldo Emerson: “Build a better mousetrap, and the world will beat a path to your door”. Was the product something the market wanted? He did not know. Were there potential customers for the product? Maybe, but he did not try to reach them and get feedback about what they really wanted.
- **Gene had filed one initial patent, but he did not protect the improvements of his invention.** He told himself, “Filing patents is expensive, right?” Later, he would find out that the basic concept in his patent application had already been known from an early 1950s patent. So the scope of protection he had was limited to the specific embodiment described in his early patent application.

- **He acquired multiple granted patents without having a use for them.** He thought that innovation started with IP, and that he needed to protect his ideas before anything else. Because of his poor understanding of patents, he filed—and was granted—patents for his one invention in ten countries, namely the US, Europe, China, Japan, Taiwan, Korea, Singapore, Indonesia and India. This was done without ever having done his market research in any of them. As you can imagine, this was very expensive, and cost him about a quarter of his entire budget.
- **He did not understand freedom-to-operate (FTO).** FTO refers to whether it is commercially safe for you to sell your product in a country, without infringing existing third-party rights. Perhaps there are patents owned by others, with potential infringement risk. Perhaps the country has strict laws and requirements. Perhaps the industry has tough compliance regulations. Perhaps the product comes with a liability that no one wants to shoulder. Basically, he thought that having a patent was good enough.
- **He did not know anything about his competitors.** Gene, like many inventors in love with their own product, lived in a world where there was no competition. Anyway, he figured that by patenting his invention, he was fully protected and did not have to worry about competitors. First, there is always competition! Second, the competition also has patents, and they may try to enforce their rights. Knowing the patent landscape allows you to evaluate business risk, and take evasive action.
- **He was not aware of different country regulations.** Electricity is a public utility, and considered essential infrastructure. It is subject to many regulations, responsibilities, and liabilities, which are not standardized. You cannot assume that what works in your home country can be transferred wholesale to another. Each market would

need its own entry strategy, even if you have a patent for that market.

- **He listened to bad IP advice, and acquired trademarks in five countries for his company logo.** This one is almost unbelievable. As an entrepreneur, you must bootstrap and spend your money wisely. Gene's cousin is a graphic designer, and he was proud of her specially-designed company logo. However, whoever gave him IP advice should be shot. Trademarking a company logo (five times!) serves no purpose other than to provide the patent attorney with paid work. If he had a developed consumer product with significant traction and brand value, maybe. But not Gene!
- **Psychologically speaking, Gene was not a natural entrepreneur. He was too nice.** Gene could not say no—he took care of every employee who needed help, such as paying for cancer treatment and helping their families with funeral expenses. He expended resources he could not afford—he supported his wife's extended family financially, and also paid for expensive holidays to visit them in another country. Ultimately, he was unable to control his business. When Gene got distracted with health issues, his software engineer, who had been working on a promising AI technology extension, took the chance to leave with all the source codes. Gene felt betrayed, but was short of money and did not like trouble, so he decided to not pursue the theft. Fundamentally, Gene did not have the right personality to make difficult but necessary business decisions.
- **Gene, like many inventors, had a stubborn, rigid personality. He was convinced that he was always right.** He thought that he knew marketing, because only common sense was necessary for understanding it. He did not actually care about marketing, spending perhaps 10 hours reading about it when he should have spent at least

1,000. All he cared about was his invention. The very fact that he invented it convinced him that there had to be a market. He did not develop his product to meet an immediate need or desire. He also ignored the fact that buyers do not want to be educated, nor do they want to do things differently. He was so set in his ways that all efforts to persuade him otherwise failed.

I met Gene five years into his entrepreneurship journey. His business was in trouble, and he had almost no resources left.

At its peak, his company had 20 people, but all have left and he is now alone. His first main investor was already burnt, and did not want to contribute more money despite holding a massive 40% equity. Gene had depleted the investments from his pool of “family, friends and fools”. In fact, his mother sold her second apartment, which was supposed to be her retirement plan, to finance her son’s dreams.

And his personal life was not doing well either. He was working from home. His wife was helping with the accounting, as he could no longer afford an office nor an accountant. His children were now 17 and 19, and entering university. He was now 54 years old, and his savings were all gone. He was thinking of selling his own apartment, but then where would they all live? Needless to say, there was family tension at home.

What really struck me was, **after five years, he had not sold even one device. He had zero revenue!** And he had no prospects for revenue! And he had no assets worth anything, except maybe those patents and company logos (but their value is questionable).

And what amazed me even further was that he was **still looking for yet another investor!** Gene came to me because he heard that I work with a lot of start-ups. He wanted advice. He wanted to spend his limited remaining resources to get more patents, so that he could attract better investors and extend his runway longer.

Gene still suffered from the delusion that his wonderful, useful and

innovative product alone was enough for business success.

I see great products all the time. But without a proper innovation strategy and without being led by a real entrepreneur, a business has two major strikes against it from the beginning.

My final advice to Gene? I told him to stop here.

## Summary

In this chapter, we have seen that:

- Start-up failure is more common than you think.
- It is stupid to glamorize failure, and bankruptcy is the worst sort of failure.
- When it comes to innovation, your thinking should move from tactics (level 3) to strategy (level 4). Ideally, you would strive for wisdom (level 5).
- If the market does not accept your product, it is much better to avoid bankruptcy by cutting your losses early and focusing on a different product. You should try to stay alive despite failed products.
- To me, the definition of success is the peace of mind from knowing that you have done your best.
- Innovators will make mistakes over the course of their entrepreneurship journey. But try not to make *all* of them, and know when to stop!

Visit [www.bit.ly/4x4-innovation](http://www.bit.ly/4x4-innovation) for Part A updates and discussion forums.



## Part B: Hierarchy

### Finding Order in Chaos

Because “innovation” can be such a broad topic, most people do it in a very haphazard way.

Innovators can get so excited by the power of their ideas that they fail to consider other aspects.

- Can their ideas be developed into a saleable product?
- What are the barriers to entry for selling the product?
- How do you prevent your competitors from copying your ideas, or at least manage that risk?
- How do you get paid and ensure sufficient cash flow?
- Are there customers who actually want the product, and are they willing to change their habits?
- What happens if customers cannot be taught to use your new product?

I believe that anyone seriously interested in succeeding at innovation needs to impose some structure. There must be a clear hierarchy of what to do, and when to do it. In short, a plan.

The good news is that there is a natural Innovation Strategy, where you apply the four innovation tactics of Research & Development (R&D), Freedom-to-Operate (FTO), Intellectual Property (IP) Protection and Market Validation across the four standard technology development phases of Idea, Conceptual Model, Prototype and Product.

Let's see how this works.

Visit [www.bit.ly/4x4-hierarchy](http://www.bit.ly/4x4-hierarchy) for Part B updates and discussion forums.



# **Innovation Strategy: The Big Picture**

## **A 4x4 Model for Bringing Your Ideas to Market**

### **Introduction**

In the previous chapter, we looked at levels of insight, definitions of success and failure, and the cautionary tale of an inventor who got it all wrong.

Here, we will introduce the concept of a successful innovation strategy in the form of a 4x4 matrix, where 4 product development phases are intertwined with 4 tactics.

This Chapter will answer the following questions:

- What are the 4 phases in product development?
- What is an inventive concept?
- What are the 4 tactics that you need for an innovation strategy?
- How does a typical inventor execute a conventional product innovation cycle?
- In contrast, what is the recommended product innovation cycle?
- Why is one better than the other, from an overall success perspective?
- How do investors think when it comes to investing in innovative technology?
- How do you prove success at each product phase, to attract investors?

## From Idea to Market

What are the phases in product development?

It starts with an **Idea**. Ideas are generally conceived by inventors. And this happens under the shower, in the bus, or other unusual places and never at work.

The idea then develops into a **Conceptual Model**. A conceptual model is a very simple model which shows that the idea in principle can work. It has nothing to do with the product. A conceptual model is all about demonstrating that the idea can be put to practice.

The conceptual model usually develops into **Prototype**. A prototype may have some similarity with the end product, but it cannot yet be considered a product. A prototype exists for testing, for you to try out whether the idea can be feasibly put into practice. Through the testing process, you also get important information like the costs in building the final product.

After a lot of testing, the prototype evolves into a **Product V1.0**. V1.0 stands for version 1.0, which is the first viable, market-ready version of the product, something that customers actually intend to pay money for. But please note that this seldom happens in a typical product development cycle, as many inventors fail before getting there. In the next section, I will explain why failure is so common and how you can mitigate it.

If customers are willing to pay for Product V1.0, over time it will develop into a Product V2.0, and so on, as the product adjusts to the demands of the market. If you get to this point, congratulations! Your idea has successfully gone to market.

## The Dream of Flight

Let's look at a specific example from the history of aircraft technology.

**The Idea.** Humans have dreamed of flying for at least 4,000 years. Perhaps one of the earliest records of imagined flight is the famous Greek myth of Daedalus and his son Icarus, who glued feathers to their arms and legs with beeswax.

Of course, biology and evolution might take too much time. Overleaf, we have a drawing by Leonardo da Vinci from about 500 years ago. Among his many talents, he was also a great engineer. Here you see his ornithopter, a flying machine that has all the elements and features of a modern aircraft. The drawing also shows how the pilot would fit into such a machine—there is a ring that goes around the belly of the pilot, a handle on the right side for moving the right wing and a handle on the left side for moving the left wing, and there are pedals for the left and the right feet. There is a tail section and a fuselage and the wings are obviously movable. So, you can imagine that this comes very close to a bird, but operated by a human being.

We call this an **Inventive Concept** (denoted by a letter 'A'). In da Vinci's drawing, the Inventive Concept A consists of the use of separate wings and the fuselage, instead of gluing feathers to the arms and legs of the pilot.

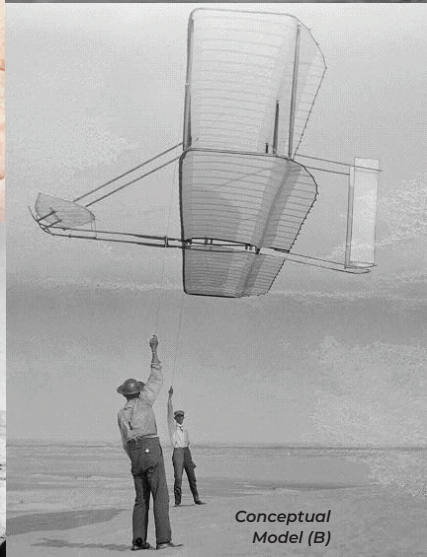
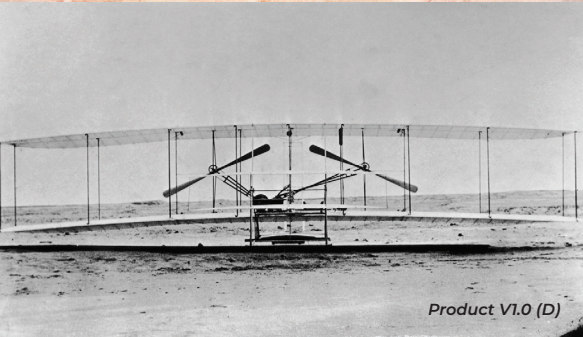
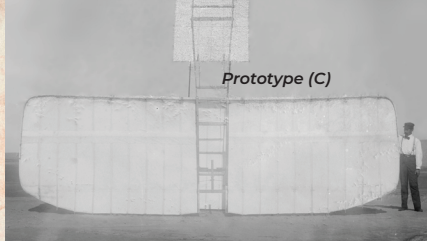
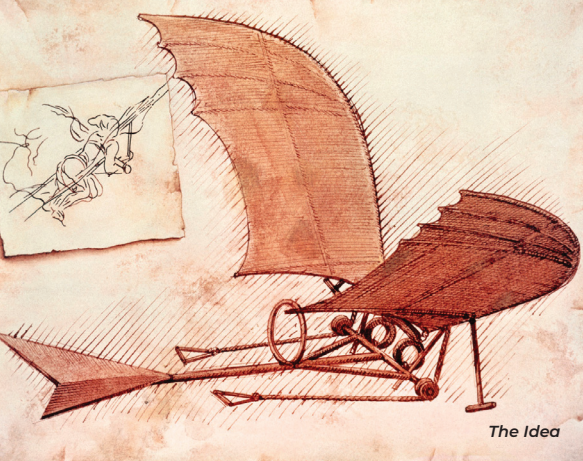
**The Conceptual Model.** This image shows the Wright Brothers in the year 1900, with a very simple glider that was not intended to carry a human being. And yet it is flying, suspended in the wind and held by two thin lines. Clearly, this proves that the idea in principle can work.

Here we have Inventive Concept B: the curved form of wings, and a tail section with a specific angle of attack against the wind in order to lift this structure from the earth.

**The Prototype.** Just one year later, the Wright Brothers developed their conceptual model into a prototype. In the image, we have Inventive Concept C: a sturdy fuselage and a very specific weight distribution, so that it can carry a human being. The picture does not show it, but the glider was actually able to fly with a pilot in it.

**The Product V1.0.** From then on, it took about nine years for the prototype to develop into an actual product v1.0. This is the famous Wright Model A, an air cargo transporter for transporting grain and meal across the USA. And now we have the Inventive Concept D, which consists of how to fix an internal combustion engine to an airplane—not an easy thing to do!

Some time later in 1918, we saw a product v2.0 that was different from



the Wright models. Developed by the Curtiss Company, it was a 160 hp reconnaissance biplane. This airplane would still be fun to fly today if you build it from the existing 1918 plans, so it is quite a modern aircraft.

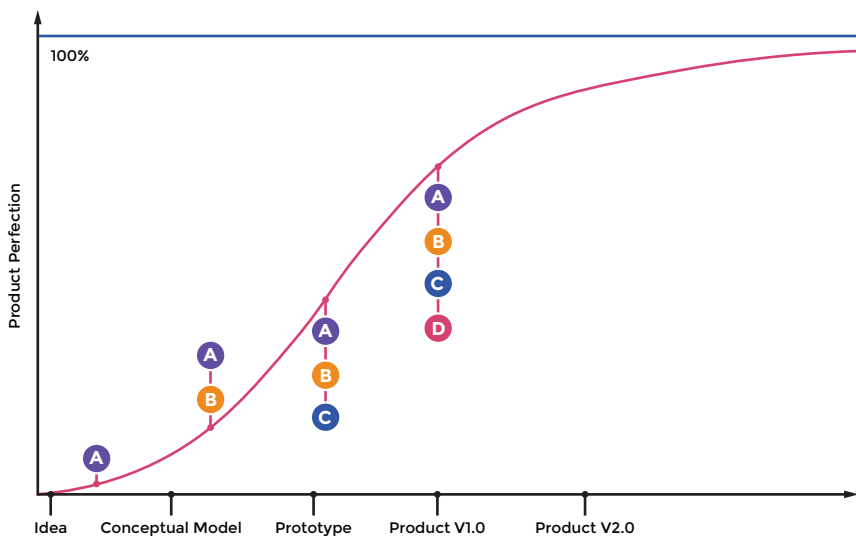
While this ends our story of the evolution of aircraft technology, there is a fascinating historical aside on the patents involved. Both the Wright Company and the Curtiss Company had filed patent applications for their aircraft. By doing so, they blocked the entire United States from importing aircraft from Europe. Later, the US government and Congress reacted by creating laws that allowed companies to bypass the Wright and the Curtiss patents, in the name of fostering market competition in the United States.

## Perfection in Product Development

How does this translate into effective product development?

Let's take a look at this fundamental curve, which puts together our product development phases and inventive concepts as a hypothetical

**Product Perfection Over Time**





measure of product perfection.

The X-axis shows the phases of the product over time, and the Y-axis is an estimation of product perfection.

At the idea stage, product perfection is at 0%. 100% perfection is marked by a horizontal line at the top; while our product will never actually get to this point, it approaches the line over the course of its development.

As you can see, an idea with an inventive concept A evolves into a conceptual model, which has the inventive concepts A and B. The conceptual model then develops into a prototype with the inventive concepts A, B and C. Finally, we have a product v1.0, which has the inventive concepts A, B, C and D.

The measure of product perfection is already pretty good for our product v1.0. Perhaps at some point, there will be a product v2.0 with a higher perfection percentage, or even more product iterations over time.

Of course, this is a picture of successful product development, where a positive cycle of growth is established after a viable product v1.0.

However, most start-up companies and most new products entering a market never survive long enough to become viable. Instead, their product development gets trapped in a doom spiral, because of a totally flawed approach to innovation strategy.

In the next section, I will explain what innovation strategy is, how most people do not actually have a strategy (and therefore fail), and an ideal innovation strategy model that greatly increases your chances of success.

## **A 4x4 Matrix for Innovation Strategy**

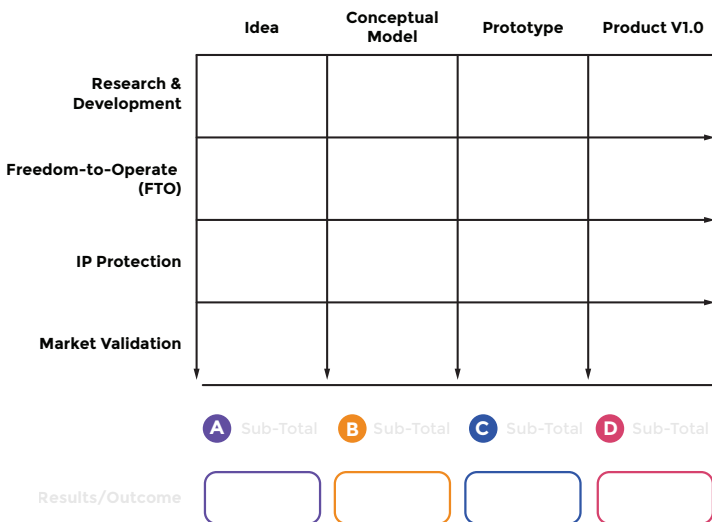
Let's review the 4 phases in product development. They are:

- The idea phase, where an inventor comes up with a product idea

- The conceptual model phase, developed to show that the idea works in principle
- The prototype phase, to test the feasibility of putting the idea into practice
- The product version 1.0, which people are willing to pay money for

Now, we put these phases along the time-based X-axis of a matrix.

### The 4x4 Matrix



On the Y-axis, we also have 4 stages:

- Research & Development (R&D)
- Freedom-to-Operate (FTO)

- Intellectual Property (IP) protection
- Market validation

These are the actionable innovation tactics that you execute at every phase of your product development.

## My IoT Mosquito Trap

Let me explain these tactics in the context of a product.

As you know, I am also an inventor. I have been living in Singapore for over 20 years, and a common seasonal problem that pops up every year is dengue, a mosquito-borne infectious disease. One of my inventions was a mosquito trap to solve this problem. It was a pretty good idea as it turned my property mosquito-free within three weeks, and I was featured in *The Straits Times*, Singapore's national newspaper, several times.

The first step is **Research & Development (R&D)**, or the technical implementation of your idea. These are the activities and processes that you do, to develop the innovative areas of your product. In the case of my mosquito trap, I developed a system that could be monitored remotely by computer, using Internet-of-Things (IoT) technology.

Next is **Freedom-to-Operate (FTO)**, which determines if you can do what you want to do. There are many potential obstacles to your freedom-to-operate. One example is *regulatory requirements*. For the mosquito trap, requirements by Singapore's National Environment Agency (NEA) would add significant costs to the product, affecting its profitability. Another could be *IP infringement*, where you run into somebody else's patents or trademarks, or you have licensing issues. Another important FTO aspect is product safety, where consumers risk suffering damages from using a dangerous product.

The third step is to **protect your IP**, or to defend what makes your invention innovative. You do this because you want to get response from



potential customers before your product goes on the market. Once you start disclosing confidential information to others, there is always the danger that they might file a patent application for your invention for themselves, or even build it and become your competitor. In my case, I filed a patent application for using a specific computer-aided remote monitoring system for my mosquito traps.

And only then do you do **market validation**, to find out if the product is something the market wants, and if there are potential paying customers. This involves getting definite customer feedback like letters of intent, reservations, paid pre-orders and paid orders as the product develops through its phases. I tested a prototype trap around my house, and interviewed my neighbors as potential customers. I even became a neighborhood grassroots leader, with the ulterior motive of getting market feedback for my invention. As a result, I got interested customers who were willing to buy the finished product.

When these phases and tactical steps are combined together in a 4x4 matrix, what you get is an elegant model for planning and executing your **Innovation Strategy**.

The interesting thing is that this model is only as effective as you make it. By itself, it is a powerful tool that can help you make decisions at various stages of your product development.

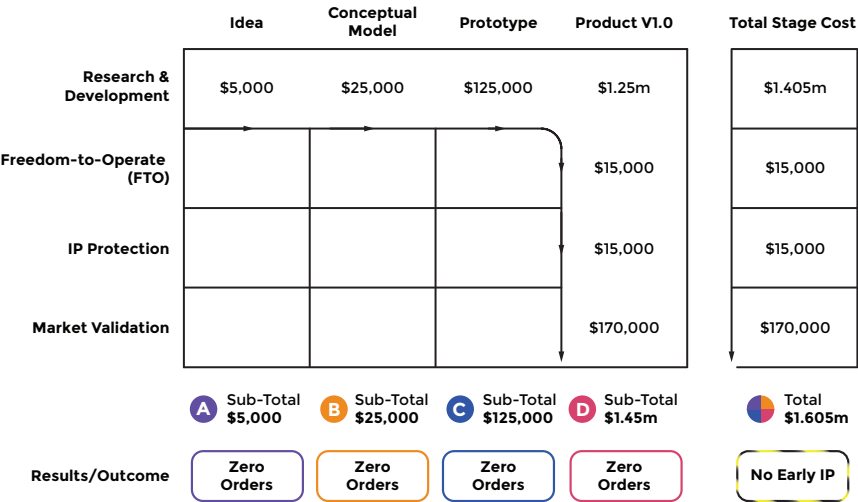
Let's see how this functions in conventional product development.

## **A Conventional Product Innovation Cycle**

Let's look at how a typical inventor will execute his product innovation. Maybe I will call him Gene, after the inventor from Chapter 1. You can probably see where this is going. But I will also put in some realistic numbers, so that this is not just a theoretical situation.

Typical inventors like Gene start with the technical implementation of the idea, and spend about \$5,000. Very often this is only a simulation, like a screencast of something that Gene has in his mind. Next, he does the technical implementation of the conceptual model, to show how it

Conventional Product Innovation Cycle



works, by investing another \$25,000. Next, he develops a prototype for about \$125,000, and then puts in another \$1.25 million to get to the market-ready and flawless product v1.0 that can be sold. In my experience, these are pretty realistic numbers for a device.

It is usually only about now that someone like Gene pays attention to FTO and puts in about \$15,000 for FTO analysis. After which, they usually realize they need to protect the IP of their idea, and this costs them another \$15,000. Subsequently, they start market validation to test the response to their new product, which costs perhaps \$100,000.

But at this point, has Gene made any sales? No! He has *zero orders* because nobody wants to buy his product v1.0.

At this point, the technicians in Gene’s team usually speak up. They say, “Oh, I told you we cannot sell this product because it has this flaw and that

flaw. We need to invest more time and money and make a better product.” So, the whole cycle repeats itself, as Gene throws his remaining resources into improving the product. (Note that technicians can be anybody with a “technician mindset”. More about this later.)

Let’s calculate the costs incurred. At this point, Gene has spent a sub-total of \$1.45 million to take his product v1.0 from R&D to market. This amount pretty much goes down the drain, because product failure rates are so high (in a hundred new products, only about one produces noteworthy revenues).

*From idea to product V1.0, a typical inventor will have spent a total of \$1.605 million, only to find out that there are zero orders, and no early IP.* In light of our definitions of success and failure, this is a true failure because there was no controlled cutting of losses, and chances of bankruptcy are very high.

### **Warning: It Could Happen to You**

Spending that much money with no results is something that I see a lot. You will only hear about the success stories, but trust me, there are far more failures than successes when it comes to innovation. In my time, I have seen about 100 bankrupt start-ups and 600 unsuccessful products, often when the inventor is liquidating his assets or discontinuing his patent applications because his product just does not work.

So, if I had to distill some words of advice:

- Do not skip the formal steps of doing FTO analysis, getting IP protection, and carrying out market validation in the early phases of your product, even if you believe that you do not need them.
- Do stop product development at an early stage if the market validation of the product is not successful.

### The Recommended Product Innovation Cycle

What you should do instead is turbocharge your inventions. You minimize your risks through a controlled cutting of losses. You give up on ideas that do not work out, and focus resources on developing better inventions.

Let's look at an informed inventor. Again, I will put realistic numbers into our 4x4 matrix.

Recommended Product Innovation Cycle

	Idea	Conceptual Model	Prototype	Product V1.0	Total Stage Cost
Research & Development	\$5,000	\$25,000	\$125,000	\$1.25m	\$1.405m
Freedom-to-Operate (FTO)	\$5,000	\$5,000	\$10,000	\$15,000	\$35,000
IP Protection	\$5,000	\$5,000	\$5,000	\$15,000	\$30,000
Market Validation	\$5,000	\$15,000	\$45,000	\$170,000	\$235,000
	<b>A</b> Sub-Total \$20,000	<b>B</b> Sub-Total \$50,000	<b>C</b> Sub-Total \$185,000	<b>D</b> Sub-Total \$1.45m	<b>Total</b> \$1.705m
Results/Outcome	3 Letters of Intent	3 Paid Reservations	3 Paid Pre-Orders	3 Paid Orders	Thorough FTO + Early Patents

You start at the same place in the 4x4 matrix, by investing \$5,000 into technical implementation to see if the idea works.

Next, instead of moving horizontally along the X-axis to develop a conceptual model, you stick with your idea, and invest in a \$5,000 FTO study. Why do this now? Because it helps you find out, very early on, if you are allowed to do what you want. Next, you protect your IP with a simple provisional patent application at \$5,000. Then comes your market validation, rather cheaply at \$5,000.

At this point, you might be asking, how can you do this without an

actual product? Well, you need to start thinking like an entrepreneur, and be more bold than the average inventor. By examining your value chain, you figure out where your product sits in it. Then, you ask potential customers to give you a Letter of Intent. This is a simple letter that basically says, “Dear inventor, I like your idea very much. If you will provide a product with this feature, I’m willing to do a prepaid purchase for 100 products.”

You should be able to get three Letters of Intent. Show them to potential investors, often family and friends. They will generally say, “Okay, I trust you. You have three Letters of Intent, so this idea is validated. I will give you some money, let’s build a conceptual model to see if this idea works.”

After receiving these three Letters of Intent, you will go through the cycle again for the conceptual model phase. Technical implementation at \$25,000, FTO study at \$5,000, protecting your new IP (these are the additional inventive concepts from the conceptual model) at \$5,000, and again, market validation. You will spend about \$15,000 to knock on doors. You will send LinkedIn messages, call people, go to trade fairs, and in general, talk with potential buyers. If you talk to the right ones, you can get three paid reservations for your as yet unfinished product. This is actual money on the table!

Now, let’s assume you take a loan from the bank, or from your grandmother, or you get an investor who believes in your idea. With these resources, you can start the cycle for the prototype phase. Technical implementation will be more expensive at \$125,000, followed by FTO at \$10,000 (now you are covering more countries, so it will cost more), followed by IP protection for additional features at \$5,000, and again, market validation. This time you spend \$45,000 to hire a professional to knock on the doors. This is usually somebody who has both market knowledge and a great network in the target market. Your goal? Three paid pre-orders. (A pre-order occurs when a customer wants to pay money for

a product that will only be ready six months to a year later.) Again, this is real money on the table.

So far things have been going well: you have three paid pre-orders and \$200,000 sitting in the bank. Now it's time to be bold again. You take out a loan for \$800,000, so that you have \$1 million with which to enter the product v1.0 stage. The technical implementation will cost about \$1.25 million, but you feel pretty secure about spending this amount, because you know that there are customers out there willing to buy it. Similarly, the FTO is only another \$15,000, because by now after sufficient market validation at the previous stages, you know who is interested in your product. Your IP will cost about \$15,000 to update it to a PCT application. And finally, marketing the product to your identified targeted customers will cost about \$170,000. The result? Three paid orders, on top of the three pre-paid orders achieved at the prototype stage.

You are in business! You have successfully sold your product to six different people, and you have a steady stream of revenue. Your positive cashflow means that you can go straight into production without worrying about your finances.

## **Two Different Innovation Strategies**

Let's compare the results of the different innovation strategies applied in the Conventional Product Innovation Cycle and the Recommended Product Innovation Cycle.

If you add up all the costs, the Conventional cycle sets you back \$1.605 million, while the Recommended cycle comes out to \$1.715 million. That extra \$110,000 is not a small amount!

However, there are other benefits to the Recommended cycle, like a shorter time to market, stronger FTO and stronger IP, leading to a higher overall success rate.

Let me explain:

- **Intermediate market validation lowers your risk, by making it easy to stop and cut your losses without suffering a big failure.** The recommended cycle is based on a series of successful intermediate results, like achieving Letters of Intent, paid reservations, and paid pre-orders. These milestones can be considered “go/no-go” points where you can proceed or stop. Maybe you have spent \$80,000 at the conceptual phase, but have only secured one paid reservation. You can take a step back and decide that, Hey, this product is going *nowhere*, let’s stop now. It is better to lose \$80,000 now, than \$1.615 million in a few years. That is what it means to cut your losses.
- **It also gives you new information about market demand.** Perhaps a customer puts in a paid pre-order and qualifies it with, “I will only buy this product if it has feature X and feature Y.” And you might have never imagined these features before. The only reason you are aware that there is demand for them is because you were going around, knocking at doors and finding out what the market wants. Then you can make an informed decision, on whether to include those features or not. With the conventional cycle, you might find out only after the product is ready. This is already too late.
- **You get a very thorough FTO.** With the conventional cycle, your freedom-to-operate (FTO) is likely weak, because any FTO analysis will take place over only a few weeks. There are likely many doubtful areas that you have not considered. If you consistently do FTO over many phases, such that it is ongoing for a year to one and a half years, you would probably have checked your product from all possible angles.
- **You take less time to market.** I cannot always guarantee this, but

if you are following the recommended cycle, chances are that you do not have a perfectionist “Technician mindset”. Technicians naturally gravitate towards perfection, and always see flaws that need improving. While this is a great attitude for creating robust products, they can have tunnel vision and spend endless hours tweaking for improvements. They can drag out the product development phases to over three years. From a patent attorney’s point of view, efficient product development should take no more than one and a half years.

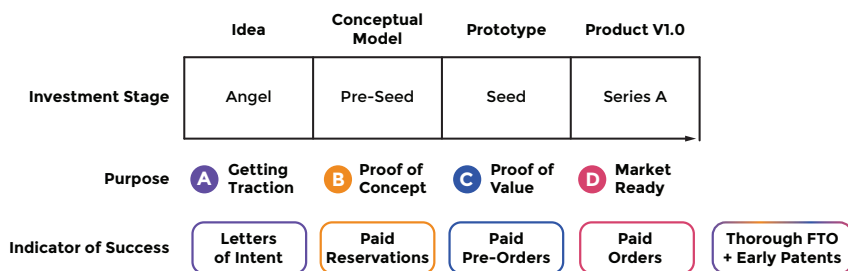
- **You get patents that have an earlier priority date than those of your competitors.** In the best case scenario, your whole product development process is only one year, or 12 months, which coincides with the priority deadline for filing patents abroad. This means that your first patent application, filed inexpensively, can be claimed as a priority for later filings, if the time duration from idea to product is within the 12 months. With a short timeframe, not only do you have a lot of momentum, but you also have very early IP. This means that your later patents are strong, because you have filed them before your competitors, and there is a lesser amount of prior art relevant against them. That is an important aspect in technologies with fast development cycles.
- **You have a better chance of success.** Each of the above factors is a tangible benefit that helps you minimize risks, strengthen assets, get more information, or reduce time to market. When you put them all together, you get real leverage.

## Investment Stages and the Product Innovation Cycle

So far we have only seen things from the inventor’s perspective. How about investors?



## Investment Stages and the Product Innovation Cycle



## How Investors Think

There is a huge gap between the investors out there and the starving start-ups that urgently and desperately need funds.

First, what do investors want? They want returns on their investment. But risk and return is correlated; investing in innovative technologies has high potential returns but is fundamentally risky.

*So an investor's main goal is to minimize the risks of their investment.*

But we run into another problem. From an investment perspective, start-ups are like a black hole for information. How do you deal with risk when there is no certainty? Often, this leads to a lack of trust between the start-up founder and the investor. The investor, especially at an early stage, knows almost nothing. Will the start-up deliver? What will they actually deliver? And when? Needless to say, investors can get very worried.

*An investor wants some certainty about their investment, with clear indicators of success or failure.*

No wonder most investors hesitate to put their money in start-ups! What they want, and what so many start-ups lack, is compelling, quantifiable facts that indicate success. Only then can they invest with some peace of mind.

## Investment Stages Meet Innovation Strategy

So how does a start-up show success, and reassure an investor that his

money will be well spent? When should an investor put in his money? What should he expect in return? Should he continue investing, or cut his losses?

Let's incorporate investment stages into the Recommended Product Innovation Cycle.

## Angel Investment

Angel investment occurs during the idea phase. An angel investor funds the development of the conceptual model. The investment amount is about \$25,000 to \$150,000. Angels get no security except what we call "SAFE", or a "simple agreement for equity", which is typically non-binding and a weak legal agreement. For this reason, investment at this stage is mostly about trust, and angel investors are usually family and friends. Still, savvy angel investors like to see some indicator of past success before putting in their money.

**Indicator of success: "getting traction".** This means that there are people interested in the idea. As an inventor, you get traction by doing some market validation, and receiving **letters of intent** from interested customers.

With your angel investment, you fund the conceptual model, and move on to the next phase.

## Pre-Seed Investment

Pre-seed investment occurs at the end of the conceptual model phase. A pre-seed investor funds the development of the prototype. The investment amount is usually less than \$500,000. The deal is usually secured again by another simple agreement for equity. Pre-seed investors are usually retired successful entrepreneurs looking to invest as a retirement occupation, or government support in the form of incubators and matching funds to stimulate the start-up sector. They too want some certainty before investing.

**Indicator of success: “proof of concept”, or POC.** This is evidence that the conceptual model has been put into practice, and that there are people willing to pay for your invention. Inventors show a viable POC by doing active market validation, and receiving paid reservations from interested customers.

With your pre-seed investment, you fund the prototype, and move on to the next phase.

## **Seed Investment**

Seed investment occurs during the prototype phase. A seed investor funds the development of the product v1.0. The investment amount is usually \$1 million to \$1.5 million. The deal is usually secured with equity, where the investor gains shares in the company, though this might vary. Seed investors can be early-stage venture capitalists (VCs), seed investment funds, or even individuals. Before putting in their money, they too need to see that the start-up has delivered something.

**Indicator of success: “proof of value”, or POV.** This is evidence that the prototype has been built, and that there are people willing to pay for a product that is equivalent to the prototype. Inventors, after aggressive market validation, must show that they have received **paid pre-orders** from interested customers.

With your seed investment, you fund the product v1.0, and move on to the next phase.

## **Series A Investment**

You have developed a product v1.0, which is a viable, market-ready product. At some point, you may start looking for Series A investment. This is typically your company’s first significant round of VC financing of at least \$2 million, in exchange for equity. How do you attract a Series A investor?

**Indicator of success:** You have received **paid orders** for your product.

You have understood and targeted your customers with a product that they need. You are actively in business, with a real revenue stream. In fact, if your cashflow position is great, you may not even need another investor!

Series A investment is for developing your product to somewhere between product v1.0 and product v2.0. After that, other funding stages like Series B and C are for scaling up your product.

I will not go into detail here, because these funding stages are beyond the scope of this book. From my point of view, you have shown mastery of the product development cycle, turbocharged your inventions, and are on a steady path of success. Congratulations!

## **Oversubscribing a Seed Round**

Let's level up. In terms of getting investors, what would overwhelming success look like?

I think this would look like the oversubscription of an investment round. This means that you get more investors or money offered than you asked for.

But getting this kind of response is not easy. You need to put in the work. Investors do not fall from the sky. Your product, no matter how wonderful, will be unknown if you do not go out there and sell it to investors.

A typical search for investors looks like this. The start-up founders will:

- Dedicate several months exclusively to fundraising pitch at different startup events
- Make literally thousands of attempts to contact investors (through email, calls and LinkedIn)
- Make contact with several hundreds of those investors who responded to the earlier contact attempts

- Gain a meeting or pitch with around several dozens of investors
- Get into due diligence with around a dozen investors

Taking usual conversion rates into account, this will end with a handful of seriously interested investors. These investors will then have to compete for the chance to invest in the start-up, otherwise the founders will have given away their equity too cheaply.

If you do as described above, you will have the luxury of picking the best investor and the best investment terms. And you can gain a million or more in investment dollars, while giving up very little equity. In other words, this is how you can win the investment game, by creating options to choose from at an early stage. Note that a strong marketing and sales-focused mindset is required for this.

## Summary

In this chapter, we have seen that:

- There are 4 phases in product development: idea, conceptual model, prototype, and product version 1.0. Products will transition to the next phase with the addition of new inventive concepts.
- A complete innovation strategy is made up of 4 tactics: R&D, Freedom-to-Operate, IP Protection, and Market Validation.
- By combining these phases and tactics, we get a 4x4 matrix that describes how innovation strategy can be applied across an entire product development cycle.
- The strategy for a conventional product innovation cycle has a high chance of failure.

- The strategy for a recommended product innovation cycle has a high chance of success.
- We compare the strategies, by putting in realistic costs for the 4 tactics, to show which gets better results.
- We also look at the investor's viewpoint, and how smart investors at every product phase minimize their risk of start-up investment by looking for quantifiable signs of success before deciding to invest.
- As a start-up founder, you must provide success indicators in order to get investment to fund the next phase of product development.

In general, the recommended innovation strategy requires you to:

- Be earlier than the competition for filing patent applications for your underlying technology.
- Perform market validation activities during R&D. You can do so without fear of your ideas being stolen, because you have your initial patent applications.
- Market validation will also provide you with a much better knowledge of what the market is willing to pay for. And also, you learn more about your product.
- Freedom-to-operate studies will teach you at an early stage whether your product is viable at all.

- Stop the product development at an early stage if the market validation is unsuccessful. It is better than continuing to develop a product that nobody wants.
- Be faster than the competition when you launch your product. Use your patent priority year wisely.

In the following chapters, we'll take you through the 4 innovation tactics in detail.

Visit [www.bit.ly/4x4-hierarchy](http://www.bit.ly/4x4-hierarchy) for Part B updates and discussion forums.

## **Part C: The Rules**

### **The Four Innovation Tactics**

If strategy is the big picture goals and the overall plan for how to get there, then tactics are the specific actions you will take along the way.

Our innovation tactics cover four areas:

- R&D, or how to develop your product
- FTO, or how to identify potential obstacles when you bring your product to market
- IP Protection, or how to defend what makes your product unique
- Market Validation, or how to determine if the product is something the market will pay for

For each of these areas, there are clear rules you should follow. I will cover them in the following chapters.

And, these all come with a time element. Speed is of utmost importance in the proper application of our innovation tactics.

Visit [www.bit.ly/4x4-rules](http://www.bit.ly/4x4-rules) for Part C updates and discussion forums.



# Research & Development

## Sustaining the Technical Implementation of Your Idea

### Introduction

In the previous Part B, we conceptualized a successful innovation strategy as a 4x4 matrix, where product development phases are intertwined with the 4 tactics of R&D, Freedom-to-Operate, IP Protection, and Market Validation.

Now, in Part C and in the present chapter, we will explore our first innovation tactic, R&D, or Research & Development.

R&D is the part of innovation that interests inventors the most. This is where they usually start from, as this is taught at engineering schools and universities. Yet, important aspects of R&D are missing. This book seeks to establish common ground between theory and practice.

From personal experience, I know that the average inventor is not at all interested in the content of this chapter, to the extent that they exist in an active state of denial about the facts. If you are a professional who works with this species of inventor, you should take occurrences of this attitude as a serious warning sign.

This Chapter will answer the following questions:

- How much time should R&D take?
- What is a typical product development and go to market cycle?
- What happens if you focus only on R&D and do not talk to customers?
- What is market validation, and why does it matter?
- At what phase of R&D should you perform market validation?

- What should you do if your product fails in market validation?
- What does an ideal product development and go to market cycle look like?
- What are some ideal responses from customers that validate your product?
- What are some common questions about R&D?
- How do average inventors, patent attorneys and marketers think about R&D?
- What are some useful R&D methodologies you should know?

## **The Curse of Perfectionism**

In many start-ups, the R&D part of product development takes up too much time.

Yes, there is useful productivity advice like minimizing meetings, and efficient development frameworks for improving processes. But these tools only work at a certain level. For many start-ups founded by an inventor, the deep-seated issue is perfectionism.

It is a generalization, but many inventors are naturally “technicians”.

By this, I mean someone with a Technician mindset: they prioritize high product quality, and like to be hands-on in the company. They are often experts in their fields, think that only they can do it right, and dislike delegating to others. There is always something left to improve before the new product can be presented to the customer. As a result, they spend too much time on product development.

In contrast, we have the Manager mindset: managers prioritize the timely delivery of the product and want the best use of company resources. They care about controlling costs. Managers are pragmatic planners and organizers who usually oversee operations and turn a vision into action. As a result, they get things done.

For our 4x4 Innovation Strategy, perfectionist Technicians in charge can be a problem when it comes to effectively executing R&D. Start-ups need a practical Manager to take charge and speed up product delivery.

In this book, I will not get into detail about the various mindsets and their underlying psychology. Look out for my future book where I will talk more about these, as well as the Entrepreneurial mindset that is often the source of successful innovation because natural Entrepreneurs listen to what the market says.

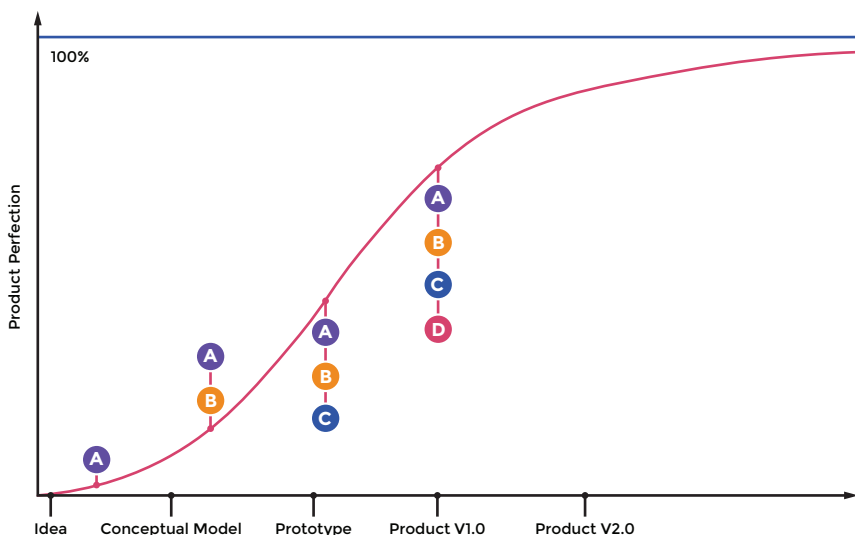
For now, just believe me when I say that perfectionism at the early stages of product development is a big red flag. It leads to the tunnel vision of a product-only focus. What happens then?

## Typical R&D Focuses Only on Product Development, and on Nothing Else

Remember the product perfection curve from page 37 the previous chapter?

It shows how your product evolves from an initial idea, by adding inventive concepts. Inventive concepts are ideas like having curved wings (from our aircraft technology example), which are technical and therefore protectable by patents. As it moves through the phases to a product v1.0, inventive concepts keep getting added, and the product increases its “product perfection” over time.

### Typical R&D Evolution



From an innovation standpoint, the question is, how do we know if our ideas A, B, C, D, etc are intrinsically valuable to the product and in demand by the market? So that if we protect, test and develop them into a finished product, there will be paying customers for it?

## Market Validation

The answer is: we need market validation.

**Market validation** is an evaluative process of *talking to people in your target market, to test your product concept against a potential target market*. It may include **marketing activities** like customer outreach, forming strategic partnerships, and raising awareness of your product. To do these, you may use **marketing techniques and tools** to elicit **market response** from your potential customers.

Some early investors do not like using the word “marketing”, as they believe that marketing is only about advertising and sales. However in this book, we may sometimes use the terms “market validation” and “marketing” interchangeably, but with the same goal of eliciting useful responses from potential customers.

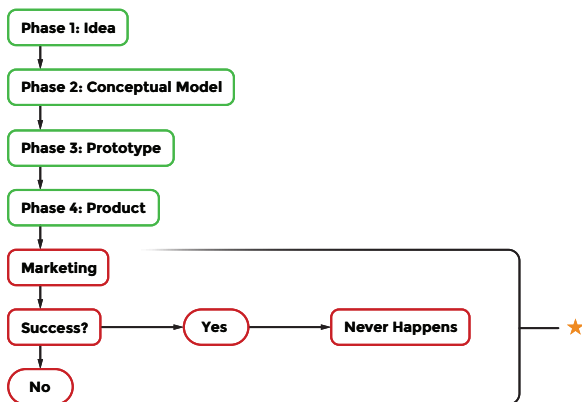
So *when* and *how* do we go about performing market validation? I find that market validation is almost never considered by start-ups and inventors. And even mature industries seldom make a connection between marketing and their R&D. Yes, they may spend part of their budget on marketing activities, but these are often erratic, inefficient or useless, because they have no strategic market validation plan.

I will go as far as saying that the marketing department should sit next to the R&D department of a company, together with the Intellectual Property (IP) department. Generally, and I cannot repeat this enough, many inventors stubbornly do not want that, just like how they also do not want a manager. These seemingly unrelated choices will affect their R&D process.

## Typical Market Validation During Product Development

Let's take a look at what happens when you focus exclusively on the technical implementation of your idea, at the expense of market validation.

### Typical Marketing and the Product Innovation Cycle



In the previous chapter, pages 41–46, I introduced the four fundamental phases of a product innovation cycle. I also showed you how a conventional cycle that leaves marketing to the end generally never results in success. Here, I streamline and visualize the same process in a flowchart.

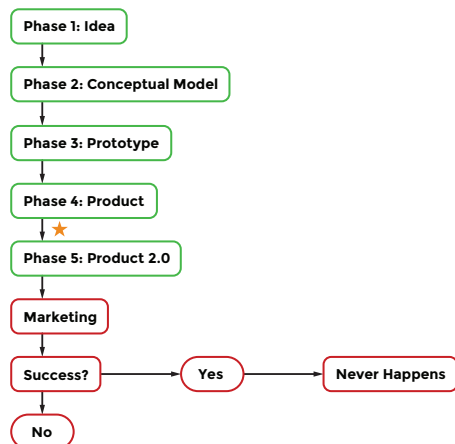
To summarize, *the typical R&D process focuses on product development and only does marketing after the product is completed.* Such an approach typically ends in market failure. Only in a tiny percentage of cases does it work.

Note that the flowchart above is a simplification. *In the real world, product development often does not stop after the first failure in the market.* Large companies can have sufficient corporate fat, cash reserves, or other business lines that can support their R&D for virtually forever.

But in the case of start-ups, R&D is often funded by the inventor's savings, after which he taps on family and friends, and finally other investors. Usually, failure is not well-received by inventors determined to create a market for

their product. They can keep pouring their money down a rat hole in a desperate attempt to find buyers.

#### Typical Marketing and the Product Innovation Cycle (Additional Phases)



(To avoid repeating myself, I will use the star symbol “★” to represent the process of moving from idea phase to product phase until market failure.) So what happens after the first market failure of product v1.0? Typically, someone with a technician mindset in the R&D team will say: “I told you this product is crappy with all the bugs. We need to make a better product v2.0 without bugs and then we will have success.”

The company then puts in more money, perhaps a million dollars, to develop product v2.0, and then executes marketing activities to promote the product. Is there success? No. We can add another star symbol to the flowchart, to represent another round of market failure.

At this stage, if the company is a startup, it is running out of money. This is when inventors start looking for people like me, because they need a patent application. Why do they need a patent? Because they have no saleable assets, and a patent at least can help them attract an investor because it produces an illusion of a new deal.

## Typical Marketing and the Product Innovation Cycle (Additional Phases)



So the inventor comes up with some new ideas that we can file a patent for. If they are lucky, an investor comes in. This is often a retired engineer who is looking for a retirement age project. The investor puts in another million or so to develop a beautiful, comprehensive, innovative product v3.0. And then they do the marketing.

Do you think there will be market success? My answer is a firm “no”.

At this point, the inventor has no more personal resources, the investor has his fingers burnt, the product dies, and maybe the start-up goes bankrupt. We can put another market failure star under product v3.0.

The scary thing is, some companies can repeat this cycle of “cash infusion > new product development > market failure” over and over, creating a zombie that refuses to die a natural death.

## Failure Analysis

So what was going on here?

The first problem is obvious: *it is a mistake not to integrate market validation with the early stages of R&D.*

A lack of knowledge of this fundamental concept affects everyone in the innovation environment, which includes others such as investors and public officers. Please note that innovation is not limited to fanatic inventors whose technician mindsets prevent them from thinking beyond the tip of their noses. I have also seen investors who previously had a one-hit-wonder with a product idea, and now seek to repeat their success with another product idea; they refuse to invest in activities they perceive as useless, such as innovation marketing. In addition, public officers who distribute grants for innovative technologies can often be prevented by their regulations from spending these monies on marketing activities that their lawmakers and bureaucrats wrongly see as banal.

The second problem, less obvious, actually compounds the effect of the first: *repeating this mistake over and over again, and not wanting to stop.*

This happens when innovators do not invent products to meet a need or desire in the market. They probably came up with their product idea as a hobby. And because they are proud of their idea, they are convinced that they can find customers. But because there is no real demand, potential customers need to be educated to use the product. At this point, inventors may blatantly refuse to realize that customers do not want to do things differently. It is difficult to change customers' spending and work habits without compelling reasons. Inventors will need to spend a lot of money that they do not have, to attempt to persuade them to use the product. Ultimately, it is far better to develop and sell a product that the market actually wants.

These are the two most important reasons behind the death spiral of failed innovative products. First, a lack of knowledge. Second, but also more often, an arrogant hidden rebellion, by both inventors and others



who invest in their products, against the laws of nature that underlie innovation. Together, this is what makes innovation fail.

## General Principles to Follow

- Never build what you think that the market needs.

*Instead, always build what people want and what they are willing to pay for.*

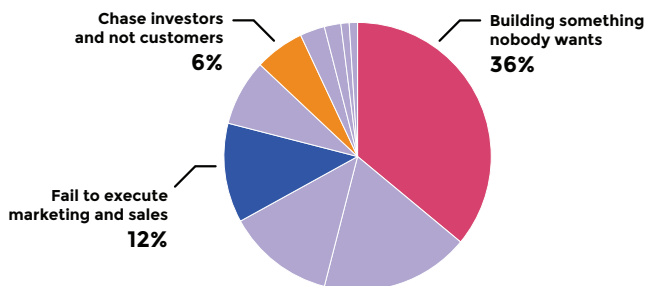
- Start with market validation at a very early stage of product development.

*If you can, start doing your market validation immediately after you have an idea, and way before developing a finished product.*

## Three Reasons Why Start-Ups Fail

Here is an interesting chart that mirrors my experience. It lists the common causes of failure for over 1,000 start-ups. In descending order, they are:

- **36% are building something that nobody wants**
- 18% are hiring poorly
- 13% have a lack of focus
- **12% fail to execute marketing and sales**
- 8% do not have the right co-founders
- **6% chase investors and not customers**
- 3% did not make sure they had enough money
- 2% spent too much money
- 1% failed to ask for help
- 1% ignored social media



Let's look at three reasons for failure. In my experience, this is how these start-up founders think:

- If they focus on investors, their priority is finding someone who can give them money. Perhaps they are thinking of how to pay their own salaries, instead of putting it into product development or marketing. Or, they get caught up in chasing further investment to get a positive balance sheet and satisfy shareholders. In either case, they are not creating actual value.
- If they fail to execute marketing and sales, it is usually because they are in love with their product, are convinced of its success, and do not believe they need to spend effort on promoting it. This can usually be linked to personality, and a prime example is our inventor Gene in Chapter 1.
- If they build something that nobody wants, it can be a combination of many factors, but fundamentally results from poor innovation strategy, where they make decisive mistakes in R&D, FTO analysis, IP protection, and market validation, as seen from Chapter 2.

I have highlighted these three reasons because they have a common underlying root cause: they are the result of not talking to the customer. These start-ups fail because they do not have a real sense of the deep needs their customer has, and are unable to provide products that solve those needs.

Adding up the percentages gives us about 50%. So, **around 50% of start-ups fail because they never talk to the customer.**

Let that fact sink in for a minute before you proceed to read further. In fact, you may want to re-read this entire section, because it is very important to know how start-ups fail and the underlying reasons for their failure.

When I realized this, it became the starting point for my career change. I could no longer merely be a sophisticated patent drafting and enforcement expert; I had to become a judicious innovation strategist. In a way, the insights of the present book are an autobiography of the first half of my life.

## **Rigorous R&D Includes Market Validation**

Now what does a rigorous technical implementation process look like?

Let's apply principles we learnt in the earlier section:

- Never build what you think that the market needs.

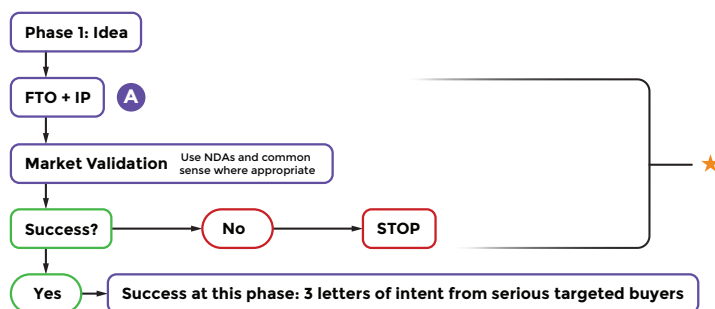
*Instead, always build what people want and what they are willing to pay for.*

- Start with market validation at a very early stage of product development.

*If you can, start doing your market validation immediately after you have an idea, and way before developing a finished product.*

# Ideal Market Validation During Product Development

## Ideal Marketing and the Product Innovation Cycle (Phase 1: Idea)



We start out with a similar flowchart as before.

But wait, where are the rest of the product phases? Here, we actually pause immediately after the idea phase, to do a FTO analysis and to secure the IP (in this case, for the Inventive Concept A).

Next, we start market validation early in the game. We do not just talk to everyone. Our marketing activities are strategic, and protected by non-disclosure agreements (NDAs) and common sense. Why do this? Because we have to share information, but cannot file IP for everything.

At this point, we pause again to check: have we managed to receive at least three written letters of intent from serious, targeted potential customers? *This is the test of our product's market success, even at the idea phase.* If there is no market response, we stop everything and go back to the drawing board.

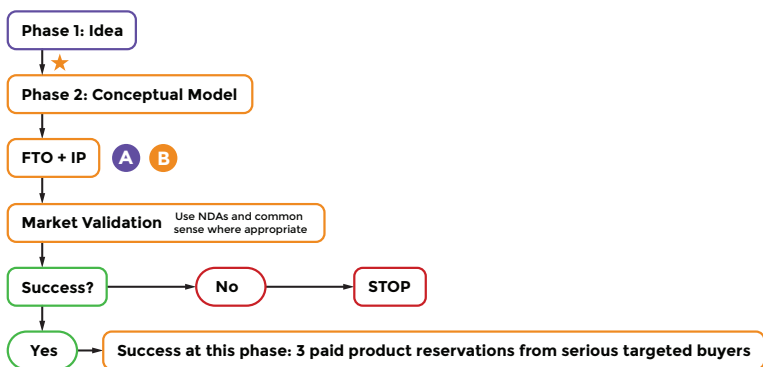
You might be surprised how difficult this can be for some inventors. Common mis-steps:

- Before they can talk to a potential customer, they feel that they need complex market research studies, long surveys, or detailed reports about expected success to boost their confidence. No, all you need is a

simulation of your idea, and it can be as simple as a brochure or image.

- They over-protect or under-protect their idea. Either they are over-worried and need to formally IP protect everything (which takes money and time), or they are careless and share confidential information without common sense.
- They only manage to get one or two letters of intent, after talking to hundreds of people. This is not actually a mistake, but how do they deal with the rejection? Do they get feedback from the customers who declined, about what needs to change? Do they see this as an opportunity for testing and tweaking their idea, or proof that their idea is worthless?

#### Ideal Marketing and the Product Innovation Cycle (Phase 2: Conceptual Model)

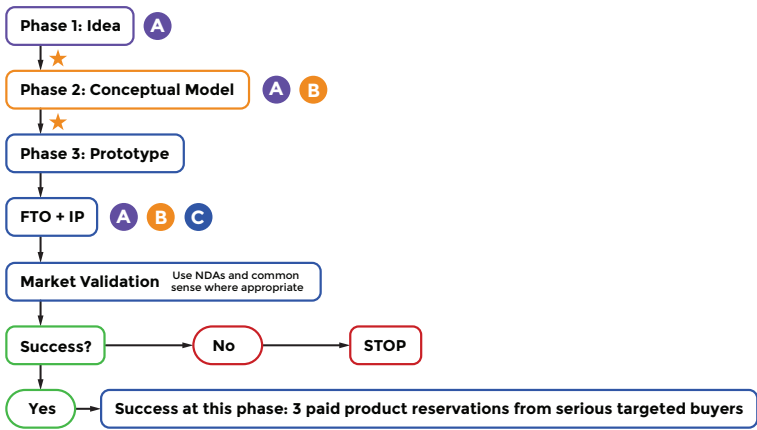


Say the idea phase has been proven successful with the three letters of intent. We then develop a conceptual model, by fleshing out the idea and adding Inventive Concept B. Again we run the FTO, IP protection, and market validation. At this stage, a good indicator of success is three paid product reservations obtained from serious targeted customers.

A paid product reservation is when a customer pays some money in advance, in order to be first in line when the finished product hits the market. This is risky for the customer. How do you convince them to put money on the table, for a product that doesn't yet exist? You will likely need:

- A **requirement list**, that clearly explains what the product must be able to do
- A **deadline**, by which you promise to deliver the finished product
- A **100% money back guarantee**, for if you do not meet the requirements or deadlines.

**Ideal Marketing and the Product Innovation Cycle (Phase 3: Prototype)**



Let's say you convince enough interested customers of your sincerity and competency, and you get three paid product reservations. Proceed to the next phase.

Now we build a prototype, and flesh it out with the additional Inventive

Concept C. Again we run the FTO, IP protection, and market validation. At this stage, a good indicator of success is three paid pre-orders obtained from serious targeted customers.

A paid pre-order is when a customer pays money in advance, to get the finished product when it becomes available. This is more money than in the previous phase, so how do you convince customers to part with their cash?

At this point, a useful way of thinking is to *change your focus from product to sales*, and start focusing on sales strategy. So far we have been talking about “the customer” as a broad category. But there are many different types of customers, and it is essential to understand their needs in the context of the market.

Consider: whom should you sell your product to? The end user, the customer, the retailer, the wholesaler? Or, perhaps license the product to a manufacturer? Or even become a supplier and consultant, to someone who manufactures?

I had a client who invented a very smart USB charging cable for phones. He did market validation of his working prototype at a trade fair in the US, where he talked to a lot of consumers who were very interested. Because the trade fair attendees were mostly end-users, he had a sampling bias problem, and assumed that his ideal customers were end-users. This made him choose a retailing market entry strategy, where he would build the product himself and sell directly to the consumer.

He then spent a lot of money in production, distribution and marketing, only to realize that he did not have the industry relationships, sales channels and retailing expertise to make it work. He then knocked on the doors of many wholesalers and manufacturers, trying to sell his stock, but at that point in the supply chain, these partners would not turn a profit. So they declined, and this product never made it to market. Perhaps if he had chosen a licensing strategy instead of a retailing strategy, it would have worked.

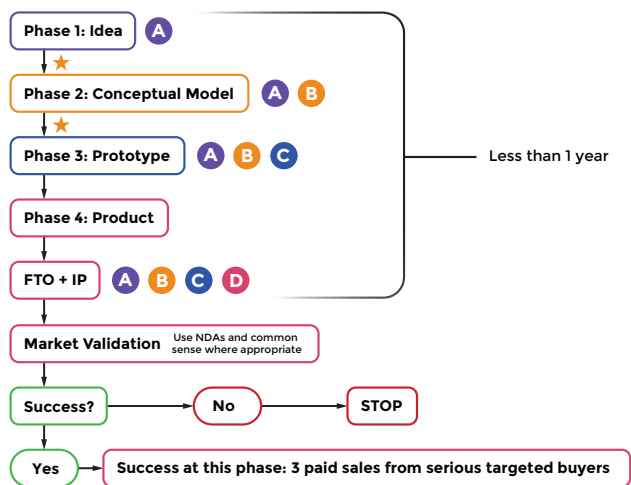
**Moral of the story:** at the prototype phase, you have to be more rigorous in your market validation because it affects your sales. Hire a professional.

Now we are nearing the finishing line. Again, we do the same things as before, which is to develop the additional Inventive Concept D, and execute the FTO, IP protection, and market validation.

The difference now is that we can use our existing paid reservations and paid pre-orders to fund these intermediate steps. Which is a good thing, because a finished product is more expensive than a prototype.

So what is our measure of success this time? Let's raise the bar. Success is three paid sales, AND *within one year of filing the first IP application for Inventive Concept A*.

#### Ideal Marketing and the Product Innovation Cycle (Phase 4: Product)



Yes, you read that right. Within one year of the filing date for Inventive Concept A, *not* Inventive Concept D. Actually, this is an ideal scenario. I have only met a few start-up companies that have met this deadline, but all of them have gone on to do very well.



Why is this one year deadline relevant?

I will show you in the next section and more answers to various common questions that inventors usually have at this point.

## Common Questions About R&D

**Q: Why should I target a finished product within 1 year of my first patent filing?**

**A: To take advantage of the patent priority rights.**

In patent laws, a “priority right” or “right of priority” is a time-limited right which is triggered by the first filing of a patent application. That priority right allows the applicant to file a subsequent patent application for the same invention or inventions as in the first application, but with the fictitious assumption that the subsequent patent application has the date of filing of the first application.

The period of priority, i.e., the period during which the priority right exists, is 12 months for patents. This period of priority is often referred to as the “priority year” for patents.

Please note that many countries allow you to file a patent application even without paying official fees, and you can still claim the priority from this provisional patent application. That comes in incredibly handy for start-ups, as it can be used for delaying costs.

Claiming an earlier priority is a bit like using a time travel sling. In patent law, when a priority is validly claimed, the date of filing of the first application, called the priority date, is considered to be the effective date of filing for the examination of the patent application. The prior art which is taken into account for examining the novelty and inventive step or non-obviousness of the invention claimed in the subsequent application would not be everything made available to the public before the filing date of the subsequent application, but only everything made available to the public before the priority date. There can be a significant difference.

For example, after filing a provisional patent application for your inventive concept A, you can show your invention to potential buyers for the purpose of market validation, and later you can still get a patent for your invention from a later patent application.

Similar regulations apply to almost all IP rights, such as industrial designs, utility models or trademarks, respectively.

**Q: I am a start-up, but patents are expensive. What should my patent strategy be?**

**A: Do not file more IP than you need.**

Basically, do not bankrupt yourself with filing IP. A start-up typically cannot afford 100 patents but by following our innovation strategy and filing for the main inventive concepts, you would end up with the IP for at least four invented features. Along with comprehensive FTO studies at every product phase, you should be fairly well protected.

**Q: I have a prototype, but getting pre-sales is hard. Can I just get an investor to fund my R&D?**

**A: Sure. But investor money is never free money!**

All right, I am exaggerating, and there is no such thing as free money. But investors invest in return for equity, or a percentage of your company shares. At the prototype stage, your company is worth little (in investment terms, it has a low valuation), so early investors are buying a proportionally larger chunk of your company for each dollar invested. This is expensive money, and affects your share dilution chances later. While this book is not about start-up economics, many start-up advisors agree: *only take as much investment capital as you really need*. Hence, the importance of pre-sales—this is actual money on the table, with no equity strings attached.

**Q: What if during market validation of my prototype, I have many interested customers, but they disagree on what the product should be?**

**A: Think of customer feedback as an experiment in clarifying your customer segments.**

Different customer segments will have different needs. At the prototype stage, it is very cheap to react to that and decide, “No, I don’t want customer X, I prefer customer Y. If I include this feature, I will get customer X, but if I include that feature, I will have customer Y. But X is willing to pay for this, and Y is not.” Well, life is not perfect. By examining the different customer needs, you can think about the relative value of your different customer segments, and structure your product and sales accordingly. And it is better and cheaper to do this at prototype phase rather than product phase.

**Q: What if I do not have enough money to cover operational costs, even after I get three pre-paid orders? Does it mean my product has failed the market validation test? Should I stop?**

**A: This where the entrepreneurial mindset comes in.**

Your product has passed the market validation test. If there is not enough money, you just have to bite the bullet and solve the problem. Say you have \$100,000 in pre-sales but you need half a million to get it going. An entrepreneur might go to a bank and get a loan, using his pre-sale orders as proof of future orders. Yes, it is a risk to take, but entrepreneurs need to have a special mindset, where they can make decisions like this. It comes down to personality, and I will explain more about this in an upcoming book about the entrepreneurial mindset.

## **R&D for Inventors, Patent Attorneys and Marketers**

In a typical start-up, how do these three groups of people think? And how does their thinking affect the process of R&D? Here are their common wrong assumptions:

**Inventors:** “My job is R&D. Why should I care about legal and marketing functions, especially early in product development?”

Inventors usually have a “build it and they will come” mindset. This leads them to focus on the technical aspects of product development and nothing else. Also, they may think that lawyers and marketers are expensive, and they do not want to pay for them until absolutely necessary.

Wrong! Our entire innovation strategy requires the inventor to consider and include both these functions as soon as they can.

**Marketers:** “I can come in when the product is ready. No marketing is needed until then.”

The average marketer thinks that their job is to raise awareness of the finished product through standard marketing and advertising activities. They think they are there to only support, with no real need to understand the product.

In an ideal situation, marketers should be sitting next to the R&D people from the beginning, performing market validation activities and contributing their insight to subsequent phases of product development. More about this in Part C, pages 123 and following pages.

**Patent Attorneys:** “The inventor only needs to come to me when there is something to patent. I’m a legal specialist, and understanding the business is not my job.”

Mediocre patent attorneys focus only on their specialty, and bad patent attorneys care only about billable hours. This is how some start-ups can spend lots of money on useless patents and trademarks that do not further business goals.

Good patent attorneys should enter the picture for freedom-to-operate (FTO) studies. They are naturally talented in raising concerns, and should

keep the inventor aware of potential issues. Inventors sometimes avoid patent attorneys because they do not like to think about these issues when focusing on product development. However, an FTO study becomes a formal channel for all parties to articulate and understand concerns specific to the product's inventive concepts. More on this in Part C, pages 83 and following pages.

### **Three R&D Methodologies**

Natural inventors intuitively know R&D, and are probably already familiar with well-known R&D methodologies. But some inventors refuse to apply R&D methodologies, which is a red flag. To me, these inventors have tacitly admitted that they are caught up in a mental silo of selfishly pursuing their own hobbies instead of developing a product that customers are willing to pay for.

The people they work with, like patent attorneys and marketers, are usually not susceptible to this virus of willful ignorance. This section is for them. Sometimes it is better to abandon a stubborn inventor early, instead of supporting them until they finally fail. A failing client may pull your own company down.

If you work for a start-up, here are three R&D tactics that deserve a closer look: Scrum, Design Thinking, and TRIZ. Keep the earlier sections in mind while reading the following descriptions, and you will immediately understand why I have chosen to feature these R&D tactics.

#### **Scrum**

Scrum is a framework for developing complex products. Initially applied to software development, it can also be applied to all technical fields, and even to marketing activities. It is intended for teams of ten or fewer members, which is a nice size for a start-up company. The team breaks their work into small goals that can be completed

within timeboxed iterations, called “sprints”. Each sprint is no longer than one month and preferably not longer than two weeks. The team tracks progress in 15-minute time-boxed daily meetings, called “daily scrums”. At the end of each sprint, the team holds sprint reviews to demonstrate the work done, and sprint retrospectives to continuously improve.

Few rules apply to sprint reviews; however, one principle is that no Powerpoint presentations are allowed, only working products.

What makes Scrum so attractive is that it fits well within the time constraints of the 4x4 Innovation Strategy described in this book. Scrum is an efficient way to boost the speed of R&D projects.

## **Design Thinking**

Design Thinking has a human-centered core. It focuses on exploring customers and their behaviors—what they say, what they want, what they do, what they think and what they feel. It involves getting insights about why and how customers behave in a particular way. You derive insights from situations, and come with relevant ideas and then solutions that customers are willing to pay for.

Design Thinking starts with defining a problem or a problem area, or an issue for the customer and a context surrounding that issue. Then you have to come up with a “Design Challenge”. Depending upon the complexity, you may spend a few hours to a few days doing this. And then you come up with a formal Design Challenge statement. The more clarity you get about who the stakeholders are and what their issues are, the more relevant the Design Challenge will be.

Design Thinking gives you some guidelines, but it is not a formula. A Design Thinking project is done by a team, and not by an individual. The team ideally should be from a multi-disciplinary background, say,

engineers, medical doctors, sociologists and lawyers, etc., depending on the context. Design Thinking aims at having “T-shaped” people as team members. A T-shaped person has depth in one area (such as engineering or sociology) and also breadth in a few other areas (such as music, law or politics). Having more T-shaped people helps team members understand and connect each other better and be more productive.

Also, defining a Design Challenge is an iterative process. You would go back and refine the Design Challenge as you get new insights and prioritize the issues.

A Design Challenge typically starts with a “How Might We” (HMW) expression. For example, a challenge could be: “How might we enable a tech-savvy person like you to move across locations without losing time?” An HMW phrase has three components: one, the user (here, “a tech-savvy person”); two, the context (“going from location to location”); and three, something that needs to be overcome (in this case, “moving without wasting much time”).

What makes Design Thinking so attractive is that the intended consumer is at the center of the innovation efforts, and that not only technician mindsets have a place in the R&D team. It encourages the gathering of many types of people under a single umbrella, to execute the four tactics of R&D, FTO, IP Protection and Market Validation. So Design Thinking fits well with our 4x4 Innovation Strategy in terms of having diverse, multi-disciplinary teams.

## **TRIZ**

TRIZ is the acronym for a Russian methodology, which means “Theory of inventive problem solving” in English. The inventor of TRIZ, Genrich Altshuller, found out from reading patent publications that creative problem solving is not as big a deal as it was thought to be.

Altschuller discovered that there are recognizable patterns to problem solving, and he called them “inventive principles”.

TRIZ says that everything is a contradiction. TRIZ is not meant for optimizing problems. At its core, TRIZ is a problem-solving approach.

According to TRIZ, universal principles of creativity form the basis of innovation. TRIZ identifies and codifies these principles, and uses them to make the creative process more predictable. At a deep fundamental level, TRIZ is a patent attorney way of solving problems. In other words, whatever problem you are facing, somebody, somewhere, has already solved it (or one very similar to it). Creative problem solving involves finding that solution and adapting it to your problem.

What makes TRIZ so attractive is that the same prior art that surfaces (when the FTO and IP tactics of our 4x4 Innovation Strategy model are applied) can be used to build an improved innovative product.

It is my strong belief that the combination of Scrum, Design Thinking and TRIZ leads to better innovation under our 4x4 Innovation Strategy model. Scrum helps to set and meet deadlines in R&D. Design Thinking puts the customer at the center of R&D efforts. And TRIZ provides efficient solutions by applying a problem-solving approach that is well-known to IP experts such as patent attorneys.



## Summary

In this chapter, we learnt that:

- Many inventors can be perfectionists about their products. They focus on high quality and can take too much time in their product development.
- A conventional product development cycle focuses exclusively on R&D (technical implementation) and ignores market validation. Do not do this.
- Market validation is an evaluative process of talking to potential customers in your target market, to test if they will pay for your product. Start this process early.
- Many companies who ignore market validation do not kill their final products after they find out that there is no market response. Instead they compound their mistakes by re-investing in R&D, creating a vicious cycle of consecutive zombie products. This strategy often leads to bankruptcy.
- 50% of start-ups fail because they never talk to the customer. Never.
- Never build what you think that the market needs. Instead, always build what people want and what they are willing to pay for.
- Start with market validation at a very early stage of product development. Ideally, do this immediately after you have a new idea, and way before developing a finished product.
- Every product development cycle should receive a positive response

to market validation at every phase. Ideal positive responses are when customers actually put money on the table. This money can be used to fund the next phase of product development.

- Ideally, you get paid sales at the latest within one year of filing your first IP application for your earliest inventive concept. This helps you to make good use of the patent priority deadline.
- The mindsets of inventors, marketers and lawyers all affect how R&D is done. Ideally, marketers and lawyers should be involved at the beginning of the R&D process.
- The combination of R&D methodologies like Scrum, Design Thinking and TRIZ leads to better innovation outcomes under our 4x4 Innovation Strategy model.

# Freedom-to-Operate

## Figuring Out What You Can and Cannot Do

### Introduction

In the previous chapter, we looked at ideal product development cycles, where R&D efforts are validated with customer response at every phase.

Here, we get into detail about the second innovation tactic, FTO.

This Chapter will answer the following questions:

- What is freedom-to-operate, or FTO?
- Why do you need to consider it?
- In terms of protection, how is FTO different from having patents?
- What are the different types of IP, and why does it matter for FTO?
- What are the other things you need to consider?
- How should you go about doing an FTO study?

### IP Versus FTO

For inventors, Freedom-to-Operate (FTO) can be a difficult concept to grasp.

Simply put, FTO is **due diligence** for intellectual property (IP) and other legal and business concerns. In plain English, due diligence means doing your homework. The development and launch of any product comes with many risks; doing your homework means identifying and minimizing those risks. While IP and know-how that is obtained from R&D is an asset, FTO is about identifying and resolving liabilities.

The problem with FTO is that it does not actually seem necessary when

you are developing a new product. Many inventors ignore it, (wrongly) thinking that IP is powerful enough to safely take their innovation to market.

## **Intellectual Property**

To start, we will define the term “Intellectual Property”, or IP. In practice, there are many possible definitions, and some are narrow and some are very broad.

As a broad general definition, IP is a term for intangible assets like ideas. IP is something proprietary, that does not exist as a physical object but has value. These assets can include copyrights, trademarks, and of course, patents. We patent attorneys have about 25 such tools in our toolbox, depending on the specific country.

Pay attention! Owning an IP asset does NOT give you a right to use these IP assets. It only allows you to forbid others to use the same IP assets, at least for a specific period of time. It is like a “no trespassing” sign.

This makes the average person think of IP as a “sword”—a weapon you wield to defend yourself by attacking others. Start-ups usually find IP very attractive, because exclusive rights give them a strategic advantage over their competition.

In truth, IP can be a very effective sword. But it is also a double-edged weapon: just like you may have exclusive rights to Inventive Concept A in your new product, a competitor might have exclusive rights to Inventive Concept B, that is also used in your new product.

## **IP Alone is Not Enough**

Here are the three main issues that start-ups face when they only consider IP, and nothing else:

– **Infringement.** They stumble over the IP of their competitors. They

trespass. They infringe their competitors' exclusive IP rights. They may not have done so knowingly, but their competitors may not care. It is within the competitor's rights to sue the start-up for IP infringement, and to demand that the start-up stops using the ideas protected by their IP. And when this happens, this usually ends the start-up. That situation is, however, less common.

- **Investor expectations.** It happens more often that potential investors come in with expectations. They or their consultants shoot down an innovative product idea because the start-up founder has not done sufficient due diligence as part of his homework. The investor does not feel safe to invest. So the founder loses his investment opportunity. Or the investor offers a much lower price than what the start-up founder has expected.
- **Unexpected obstacles.** It also happens quite often that unexpected costs or hurdles occur only when the new innovation is brought to the market. At this point, a lot of money has already been invested in the product. This late failure often kills the product, and perhaps even the company.

So IP alone is not a magic cure. For start-ups, another aspect is much more important. My personal opinion as a patent attorney is that nothing beats “Freedom-to-Operate”.

## **Freedom-to-Operate**

Here is a picture of a famous team building game called Minefield. Two teams compete by each sending a representative to walk through a simulation of a minefield, and the first one to reach the other side wins. The catch is that the representative is blindfolded. He cannot see where he steps. He can only move under spoken commands by his team. And



there are explosive mines everywhere, represented by small balls on the floor. If he steps on a ball, it is game over.

In this analogy, each ball is an IP right owned by a competitor, or a hairy monster in the form of an unexpected requirement for putting your innovation to practice. Some are very dangerous; these are marked here in red. Some are less so. Unlike in the actual Minefield game, stepping on some balls may not kill you. There can be varying degrees of damage, ranging from litigation resulting in bankruptcy and total business failure, to minor tweaks in your product development, or just ignoring that IP.

The thing is, you need an expert to discern which IP is a red ball (dangerous) and which is not. The same applies to the hairy monsters, or other types of legal and business matters that may affect your intended product.

## FTO Clears a Safe Path

For the IP part of it, this is where a formal FTO study comes in. Basically, patent attorneys will identify potential obstacles to bringing

your ideas to market. They do this by searching through the existing patent literature, identifying relevant third party (competitor) IP rights and assessing the possibility that your product may infringe these IP rights.

For the business and regulation part of it, you will have to develop your own expertise, or rely on experts in these fields to identify the obstacles. That is what makes it difficult.

To summarize, **an FTO study clarifies what you can do and what you cannot do**, in order to clear a safe path through potential obstacles. While FTO is just one out of the four innovation tactics in our 4x4 Innovation Strategy Matrix, **all your efforts in R&D, IP protection, and market validation will fail if your FTO does not work out.**

Next, we will look at the various types of IP out there, to understand more about preparing a proper FTO study.

## Types of IP

In the narrowest sense, IP is the registered and unregistered proprietary rights that exist over intangible assets. (“Registered” means that the IP right is registered, filed, or issued under the authority of a government body, usually a patent office.)

## Registered IP

Here are the various types of registered IP:

- **Patents and Utility Models:** protective rights for technical inventions.
- **Trademarks:** signs which are used to distinguish the origin of goods or services from one company from those of another company.
- **Registered Designs:** similar to copyrights, but registered with an

Intellectual Property Office.

- **Plant Variety Protection:** protective rights for breeds of plants like flowers, vegetables, and trees.
- **Registered Semiconductor Topographies and Layout Designs:** designs for integrated circuits; they are rarely used in practice and generally limited to the semiconductor industry.
- **Geographical Indications:** used to denominate a product's origin from a specific part of a country. Famous geographical indications include Champagne (the sparkling wine) and Camembert (the cheese).
- **Registered Typographic Fonts:** used to denominate a collection of letters that is used on a computer or in printed form. Examples include common fonts like Courier New or Arial.
- **Internet Domains:** used to denominate the address of a webpage and also for emails.

## Unregistered IP

These are core IP rights that do not require official registration. They emerge by creating something.

Here are the various types of unregistered IP:

- **Trade Names / Company Names / Common Law Name Rights and Rights Under Passing Off:** official names under which a company does business
- **Copyright.** A registration of a copyright is not required for copyright protection itself, but in some countries, you must register a copyright



in order to assert it against infringers.

- **Unregistered Designs:** very similar to Copyright.
- **Confidential Information, Trade Secrets and Know-How:** valuable commercial information that is kept secret through a company's own precautions

## Searchability and FTO

You may be asking, why should I care about the difference between registered and non-registered IP?

It's simple. We make this distinction because registrable IP is searchable, but it is impossible to conduct a comprehensive search for non-registrable IP. That is important for our FTO analysis. You cannot conduct a FTO study for intangible assets that are non-searchable.

This means that **FTO studies, while essential, also come with a certain amount of uncertainty.** In other words, there may be some seemingly invisible obstacles along our safe path.

## Other Types of IP: Agreements

The meaning of the term "IP" does not stop here. In a slightly broader sense, IP also encompasses certain types of agreements. These agreements can grant permission for the sales of a product or provision of a service within a given territory, or even a context where the product or service is affected by an IP right. Agreements are searchable, and can come under an FTO study.

Common agreements include:

- IP Assignment Agreements
- Confidentiality Agreements or NDAs (non-disclosure agreements)
- Licence Agreements

Less common, but also included under IP rights, are:

- Research and Development Agreements
- Franchise Agreements
- Joint Venture Agreements
- Distributorship Agreements and Supply Agreements
- Non-Compete and Non-Solicitation Agreements

As you can see, the term “IP” can cover a very broad range. A proper FTO study will have to take this into consideration.

### **Other Key Legal and Business Matters**

In an even broader sense, FTO should also consider other key legal and business matters. These can affect IP rights, the products encompassing those rights and how IP is managed in general.

Some key examples are:

- Competition Law issues/Unfair Business Practice issues
- Product Certification and Registrations, or Regulatory
- Approval (e.g. for pharmaceuticals, cosmetics, medical products, waste handling, mining etc.)
- Use of paid online reference services (e.g. Google AdWords)
- Restrictions of information flow internally and externally
- Data Protection matters
- Product Liability issues
- Environmental Law issues
- Enforcement issues, such as border seizures
- Money laundering issues

Do not get blind-sided. FTO is not only about IP infringement. There are legal and business matters that can become the “hairy monsters” I mentioned earlier, in the form of unexpected requirements for bringing your product to market.

## **FTO and the Mosquito Trap**

Do you remember the mosquito trap mentioned in Part B? I invented a computer-controlled mosquito trap that effectively punched a hole into the dengue map of Singapore. At the idea and conceptual model phases, I did quick FTO studies to look for existing patents protecting the inventive concepts. I did not find any. So no issues of IP infringement. I was very pleased and eagerly went on to develop a simple prototype, which I tested around my house. The prototype was so good that while a school only 100m down the road had 300 dengue cases, my house and my immediate neighbours’ houses were mosquito-free. As an inventor, I got really excited. But as a patent attorney, I was still cautious. I knew I must do a broader, more comprehensive FTO before putting in more money to develop an actual product v1.0.

And what did I find out? Singapore has a Vector Control Act that forbids the operation of my type of mosquito trap without a special safety license. Keeping this license up would increase the cost to \$600 per trap per month, and there was just no business case for it. I brought my prototype data to the National Environment Agency (NEA), and while the results were good, my trap design was not considered safe to operate without the license. A good product was only part of it; I had to guarantee regulatory compliance.

Also, there were other concerns from a public health standpoint. It was not right to allow my mosquito trap because selective adoption has potential negative consequences. Imagine that a customer is willing to buy the trap, but they later terminate their maintenance contract that services the trap. The mosquito trap would stop working well and

probably even promote breeding of new mosquitoes. Suddenly there would be more mosquitoes than before, creating a breeding hotspot and increasing the neighbourhood's chances of dengue. As an engineer, I could develop the product. But would I be able to ensure the availability of maintenance services, or enforce ideal customer behavior? Would I be able to ensure widespread and systematic adoption to mitigate the risks? It took me some time to understand that successful market entry was not about product and IP alone, but includes issues of cost, regulations, and in this case, public health considerations.

IP is not enough. FTO studies can discover obstacles that are blind spots. And because these obstacles can change with the business environment, FTO should be done at all phases of product development. Never assume that you know everything; it is better to engage experts to conduct due diligence to identify these obstacles.

## The Importance of FTO

Personally, I think that FTO is one of the most complex topics in innovation, because it can be so broad and vague and still have a crucial impact on the success or failure of your innovation.

In the first place, a thorough FTO analysis is not easy because there is so much material to cover. Even if we only consider patents, there are more than 100 million potentially relevant patent applications in the world; on average at least a few thousand will apply to any area of technology. *The difficulty lies in identifying which of those thousands of patent publications are relevant to the specific technology underlying your product. A further difficulty lies in identifying which of these are potentially dangerous, and to what degree.*

To me, FTO is an unending groping in the dark. Practically speaking, it boils down to reducing the business risk to tolerable levels, depending on the available budget.

Some principles to make your FTO analysis easier:

- How does one eat an elephant? In small chunks.
  - The earlier you start, the better it is. Early FTO gives you a more mature understanding of obstacles over the long term.
  - Do FTO many times, at different points across all product phases. Instead of condensing all your efforts into the short period just before market entry, spreading out your efforts will get you better returns.
- In a way, FTO can be considered the most important of the four innovation tactics. If you step on an unforeseen obstacle, it has the power to kill your product or company. Do not ignore FTO!

## Summary

In this chapter, we learnt that:

- An IP right gives you exclusive rights to use certain intangible assets. An FTO study clarifies what you can and cannot do with these assets, in order to clear a safe path through potential obstacles.
- In short, doing an FTO study is doing due diligence for IP and other key legal and business matters. It means doing your homework to identify and minimize potential risks.
- Many think that acquiring IP alone is enough protection. This is wrong. FTO is necessary for identifying potential IP infringement, for making potential investors feel safe to invest, and for identifying other unexpected obstacles at an early point in time.
- There are many different types of IP. They are not all easily searchable and that explains why an FTO analysis always comes with some inherent uncertainty.
- There are also other legal and business matters you need to take into account during an FTO study. These can result in unexpected obstacles.

- While FTO analysis is just one of four innovation tactics that make up a comprehensive innovation strategy, all your efforts in the other three tactics of R&D, IP protection, and market validation will be wasted if your FTO tactic fails. It has the ultimate power to kill your product or company.
- FTO is difficult. Do FTO analysis in small chunks. Start it as early as you can. Do it many times, across all product phases. This will get you the best returns.

# IP Protection

## Protecting Your Underlying Intellectual Property

### Introduction

In the previous chapter, we learnt what FTO is, why it is important, and the difference between acquiring IP and providing an FTO analysis.

Next, we dive deeply into our third tactic, IP protection.

This Chapter will answer the following questions:

- What are patents, and what can they be used for?
- Are patents enough for IP protection?
- What can't you do with patents?
- At which stage of my product development should I file a patent?
- What are some common IP filing strategies?
- What are some common mistakes in IP strategy?
- Do start-ups actually need IP?
- What are good reasons for IP protection?
- What are bad reasons for IP protection?
- What is IP infringement?
- What are injunctions, and what does a typical legal process look like?
- Who should own the ideas that govern an entire industry?
- How do patent pools help avoid running foul of competition laws?
- What are NDAs, and how useful are they?
- What are practical ways of ensuring confidentiality at an early stage?

### What are Patents?

When most inventors talk about IP, they usually mean patents. From the previous chapter, you know that there are many types of IP, of which patents are only a part.

Still, patents are the type of IP you are likely to encounter often as an inventor of technology. This is because *they protect technical concepts that*

*are novel, inventive and have an industrial application.*

### **Sword, Bug Repellent, Magic Object?**

Patents are powerful, because they are like a sword, bug repellent and a magic object, all in one single tool.

- **Patents are like a sword, a weapon to sue your competitors for infringement.** If found guilty of infringing your patent, your competitors may face injunctions (a court order to stop work), damages (monetary compensation) and even destruction (they need to destroy their products that use your protected inventions). Also, there is money and time spent in litigation. Lawsuits generally waste your competitors' resources, and tend to be a big business setback.
- **Patents are like bug repellent, a deterrent to your competition and third parties.** A patent is also a *prior art document*, which shows what you have done at a certain point in time. It is evidence that your idea was already known at a certain date, and therefore your competitors cannot claim that idea in their own patents. Some third parties like bureaucrats are especially averse to infringing patents, and respect their very existence. This gives you an advantage when talking with governments about your plans, especially if the ideas involved are well supported by patents.
- **Patents are like magic objects, because very few people fully understand how they work.** They have a supernatural aura, and they give you a supernatural appearance with extra powers. At least, most people think so. And we can use this because sometimes in business, perception is everything. Patents are intangible assets with both real and perceived value. The presence of patents may help you find investors, make competitors change their business strategy, or give others



confidence in your product and company.

## Patents are Multi-Dimensional

A patent gives you the right to exclude others from making, using, selling, offering to sell, or importing your patented invention for a limited period of time. In exchange for the right to exclude others, your patent must disclose your invention in detail to the public. This is the deal with the government that grants the patent.

You get a patent either by filing a patent application with a patent office yourself (if you know how to do it), or by engaging a patent attorney who will draft and file the patent application for you. As always, it depends on whether you want to spend money for someone to do the work, and whether you will be happy with what the patent office gives you. Please note that the purpose of a patent office is not to help you, but only to grant patents and nothing else.

Patents are defined by some important constraints:

- **Scope of protection.** This is mainly, but not entirely, defined in your patent claims. It means the boundary of your right to forbid many things that fall within the scope of the claims.
- **Territorial area.** Patents are territorial rights. They are only applicable in that country where they have been filed and granted.
- **Patentability.** Not everything can be patented. Your invention must be:
  - Novel. It does not belong to the prior art, i.e. it is not previously known to the public, although there are some exceptions.
  - Non-obvious. Sometimes this requirement means that it must also be inventive, whatever that may be defined as in the specific

country that you are looking to file the patent in.

- Some countries require that a patented invention must be useful or applicable in an industrial area.
- **Time.** Exclusive rights are limited by time. This is often, but not always, 20 years from the day you file your patent application.

The above definitions can be confusing. In general, you should not spend too much effort trying to understand them. Many people do not, which is why we have patent attorneys.

As an engineer, I would say that patents are multi-dimensional problems because of these many constraints. Patent protection cannot be easily extrapolated. The type of language used in a patent application can also be problematic for many people. This is another reason why patents are not ideal DIY projects.

It happens often in practice that the scope of protection and patentability is influenced by the surprising discovery of a new piece of prior art, or potential evidence that your invention was already known when you filed your patent application. Most people—everybody except patent attorneys—think they can solve this as a standard legal problem with a linear approach, but it is not so simple.

Let me give you an example. Assume that a competitor has infringed one of your patents. To assert your patent against the infringer, very likely some explanation is needed to match your patent claims with the allegedly infringing product. By explaining the meaning of your patent claims you open the same patent claims to new invalidity attacks, as new prior art may be read onto your patent claims because of your earlier explanation.

Does that already sound complex? That was only one of maybe a hundred or more standard situations for patent infringement. Patents are difficult.

They are a big topic and you will not be able to learn everything overnight, nor even in several years.

For my inventor readers, my hope is that you become sufficiently informed. I want you to at least know where you are ignorant, so that you do not fall into the dangers of half knowledge and end up making stupid mistakes.

For my lawyer readers, I repeat that patents are multi-dimensional, not linear, legal problems. I believe you will need to practice as a patent attorney full time for at least five years to even scratch the surface of this area of law. Not to mention actually reaching a full understanding of what you are doing.

## Common Patent Myths

Patents are not all-powerful. We will bust a few common myths.

**Myth: If I have a patent, I have permission to do what is patented**

**Reality:** This is totally wrong, and often overlooked. A patent only means that you have acquired a sword, but **it is not a licence** to do what you have patented. Others can still use their own patents against you. In other words, you may have a patent that is dependent on another patent.

**Myth: A patent is carved in stone**

**Reality:** Wrong! For a variety of reasons.

- Patents may be **incorrectly granted**. The examiners of the patent offices have only a limited time to research patentability, and they often grant you a patent for a known idea. Actually, that is the normal case.
- Patents are **territorial**. This is why we have different patents for the same applicant and inventor in different countries. So you may get a patent with a broad scope of protection in one country, but with

a narrow scope in another country. And there are many countries where there is no patent at all.

- Patents **can be revoked**. Just because a patent is there, does not mean it will be there forever. Patents can always be challenged with a revocation request. I personally have seen the death of many. Actually, I love destroying patents. Just as much as I love drafting them.

**Myth: There is a thing called a “poor man’s patent”, where you mail a description of your invention to yourself.**

**Reality:** This is nonsense. **There is no such thing as “first to invent”; the “first to file” is he who owns the right.** Historically, it was true that “first to invent” was used in the USA to establish priority, for example by bringing laboratory notebooks to court as evidence. However, this was before the Leahy-Smith America Invents Act (2011). After this law was enacted, the “first to invent” principle was abolished. Worldwide, the first to file has priority. But some people have not heard of this update. This is why you need a patent attorney.

**Myth: Keeping a laboratory notebook or documenting the conception date of your invention will beat out someone who files the patent first.**

**Reality:** No. See the previous point.

**Myth: A prototype must be made before filing a patent.**

**Reality:** You can get a patent if somebody, probably an engineer, can **describe your idea so that someone else can make it.** Drawings can help. Even without developing the idea into a prototype.

**Myth: Software cannot be patented.**

**Reality:** Wrong. You can get patents for software. I have been doing

software patents for over 25 years.

**Myth: NDAs are an alternative to filing a patent; NDAs will prevent others from copying your idea.**

**Reality:** NDAs, or non-disclosure agreements, are not powerful enough. They are good for generating confidence between two parties, but they **seldom stand up in a court**. I have represented both sides in several court cases, and every time, the NDA owner who tried to sue the other party lost the case. This does not mean that NDAs are useless. On the contrary, they will make you feel better, and also help create trust and accountability. But **always protect your important ideas with other underlying IP rights** like patents, trademarks, designs, etc. See the last part of this chapter for more about the use of NDAs to protect your IP.

**Myth: I have the right to continue what I already do. There is a law in my country that states that I can continue any use that began before the priority date of someone else's patent.**

**Reality:** Smart entrepreneurs usually bring this up when infringing a patent. For example, suppose you have a construction site and you discover a new method of aligning certain building components. And this method is later patented by someone else. You might think: I have done it on that construction site, so I can continue doing it.

While it is true that there is such a basis in law in many countries, **this is an extremely limited right**. We will replicate the entire right here:

“Where a patent is granted for an invention, a person who in country XYZ before the priority date of the invention, does in good faith an act which would constitute an infringement of another patent, if it were in force, has the right to continue to do the act or, as the case may be, to do the act, notwithstanding the grant of the patent.”

And here are the many ways this right can become invalid:

- The earlier “act” must have been done in country XYZ. Very often it was done in country ABC or somewhere else, but not in country XYZ.
- The right to continue the act is conferred on the specific earlier “act” of using the invention. This means you must stick in the future to exactly how you did it before. Any further development can be considered a patent infringement.
- Licensing of this right to other parties is not allowed. You cannot monetize your knowledge in any way, except when using it yourself.
- This right sticks to the business, and can be transferred to third parties only together with the business. So, you cannot transfer it to a subsidiary, and if your company dies, the right dies with it.

I can think of more actual business situations where this right would be limited to the point of uselessness.

### **Moral of the story:**

Patents provide very good protection, but do not cover every business possibility. They should be considered holistically, as part of your entire innovation strategy.

In general, patents are a powerful tool, but tools are only as effective as you use them. How can you use them well? What if you use them badly? In the next sections, we will review common filing strategies and situations where poor strategy can lead to bad outcomes.

## **IP Filing Strategies**

Commonly known strategies for filing patent applications include:

- Cost-driven filing strategies: let the costs determine what you file where

- Market-driven filing strategies: file where your customers are
- Competition-driven filing strategies: file where your competitors are
- Enforcement-driven strategies: file where there are developed legal systems so that you can easily assert your granted patents against others

The problem of developing a strategy for filing patent applications with a limited budget is comparable to the problem of a dog marking his territory: you cannot pee at every tree.

There are myriads of books out there that explain how certain goals can be achieved when a specific filing strategy is used. It is not my intention to add more to this well-grazed area of patent law. Within any given budget, it is usually easy to find a filing strategy that works while costs are kept down.

But I want to highlight two often forgotten alternatives to filing patent applications:

**Alternative Strategy 1: Not filing a patent at all.** *If you can keep your invention secret, it can be better to not file a patent application for it at all.* You remember the deal you make with the government? In exchange for the right to exclude others, your patent will disclose your invention in detail to the public. After your patent expires, anyone can use your invention without any restriction. This makes it extremely unpopular to file patent applications for processes that involve heat treatments or other manipulations that do not result in features that can easily be found in the final product.

**Alternative Strategy 2: Do a defensive publication** if you decide to not file a patent application for your invention. The basic idea of a defensive publication is to create a “state of the art” or “prior art”, which can be cited against your competitors’ patent applications that

are subsequently filed. That prevents your competitors from obtaining patents for those inventions that you decide to use without having them protected by your own patents.

Where should you publish your defensive publication? Of course where nobody looks! You do not want your defensive publication with your invention to become easily available to your competitors. This is the dilemma of creating defensive publications: on one hand, you want to create prior art such that your competitors cannot patent your invention for themselves; but on the other hand, you do not want your competitor to gain access to the technical teaching described in the defensive publication. *Ideally, the defensive publication is available to the public but at the same time difficult to find.*

This approach opens a wide field for patent experts. I have invented numerous ways for generating defensive publications and do not want to reveal them in this book. But if you deal with me in my capacity as a patent attorney defending a client, you should always be prepared that I pull out a defensive publication rabbit from my top hat.

As the focus of this book is on innovation strategy, this section will be rather short. If you want to find out more about specific patent filing concepts, please look for other books in this area or become a member of my website at [www.ip-lawyer-tools.com](http://www.ip-lawyer-tools.com).

## IP Strategy Mistakes

Let's look at common IP strategy mistakes that start-ups make, and how they fail to optimize the effectiveness of their IP.

## Getting Invented Around

Instead of protecting the underlying technology, which may cover a range of applications, you only patent exactly what you are selling. This results in what we call a narrow patent claim. And because of this,



your competitors get the opportunity to “invent around” your claim, accomplishing the same result by using a different way that does not infringe your patent.

**IP strategy mistake:** Making too narrow a patent claim.

**Solution:** Apply patent broadening techniques, and conduct a hostile examination of the invention disclosure. This can be done by creating patent challenge teams in the same company.

### **Getting Invented on Top of**

A value chain includes all the business activities involved in creating a product from start to finish (e.g. design, production and distribution, etc.). However, your patent describes a core technology that only resides early on in the value chain. This allows competitors to invent “on top of” your patent, and lock the use of your invention further down the chain.

**IP strategy mistake:** Not protecting additional uses of your invention.

**Solution:** Look for patent opportunities that are downstream on the value chain, for example, the use of your invention for achieving something new. Do not only consider the invention itself, but also what can be done with your invention.

### **Getting Blocked for the Future**

Assume that you have developed a good product. Your competitor is more forward looking and starts patenting core technologies for the next generation of your products. By the time you start developing your next product, the minefield of possible patent infringement is already waiting for you.

**IP strategy mistake:** Waiting until you develop a new product before filing a patent.

**Solution:** Avoid this situation by making forward patenting a priority.

## Filing Too Late

Assume the following: you have developed your product, and a few days before its public release, you file a patent application. After nine months or so, you discover that your competitor who works in the same area has filed patent applications for similar inventions, just a few months before you.

This is a bad situation, because when it comes to patent protection, the governing principle is “first to file”.

In my experience, the development of a product is seldom invisible. Over the year, competitors who have done their homework will know approximately where you are. Assuming you are both racing to build a similar product, they can always decide to hedge their business risk and stake a claim by filing their own similar patent application.

The earlier filing of the competitor product anticipates the inventive concepts which are fundamental to your product.

Remember, a *patent is a deterrent like bug repellent*—your competitor has filed earlier to deter you from using those foundational inventive concepts. And a *patent is also a sword*—if you build your product with those protected inventive concepts and infringe on his rights, he can take you to court.

If you find yourself in this situation, I am sorry. It is a very bad situation and no one in the company will be happy about it, especially not potential investors.

**IP strategy mistake:** filing too late, thus allowing your competitors to have an earlier priority date and to stake their claims on your foundational inventive concepts.

**Solution:** secure an individual priority for each one of the inventive concepts A, B, C and D as soon as they have been conceived, such that each one of these inventive concepts receives its own priority date.

In this section, you might have come across some unfamiliar concepts that were not explained in depth. Again, my intention in this book is to focus on innovation strategy, and not on the use of patent law in achieving certain filing goals. If you want to find out more about specific patent strategies, please look for other books in this area or become a member of my website at [www.ip-lawyer-tools.com](http://www.ip-lawyer-tools.com).

In the next section, we will consider the use and misuse of IP protection, whether you need it, and what are some best practices.

## **Do Start-ups Actually Need IP?**

### **Short Answer: No**

I hear this question dozens of times a year. Do start-ups actually need IP?

The short answer is: “No.” A start-up does not need IP. No one needs a patent, a trademark or any other IP to sell a product. There is no legal obligation that you can only sell a product if it is IP protected.

But this question is a prime example of Hobson’s Choice, or an illusion of choice. It is a comparable question to “Do you prefer cholera or plague?” Or, which way would you prefer to get sick? In other words, it is not really a choice at all. Your options about IP are to take it or leave it.

At the same time, I firmly believe that a start-up that wants to stay alive needs customers and not expenses for patent attorneys. So a start-up should make sure it is always liquid before considering IP.

So, in short: no, a start-up does not necessarily need IP.

### **Long Answer: it Depends (But Likely it is a “Yes”)**

In reality, it is very likely that a start-up will need IP.

Perhaps the only exception to this is if you can survive on your own—without any third party capital. Even so, you may prefer to have IP protection instead of going unprotected. Again, this is your choice. But please note that the situation changes when professional investors come in. They are very likely to want a strong IP position.

Let's look at some situations where IP is a good thing:

– **“Patents can increase the chances that a start-up will be acquired.”**

Yes. The main reason why professional investors want patents in place before they invest into a company is to make sure that the inventors do not run away and open a similar business right next door, after the investment has been made.

I have seen this situation often. If a company is about to be taken over by existing investors, the inventors (CTOs and CEOs) usually start thinking, “Can't we do the same thing without our investors?” Very often, this is prevented by a patent portfolio in place.

– **“Patents can help a start-up get ready for an IPO.”**

Yes. Institutional investors will only buy shares of a new company after performing due diligence, which includes IP due diligence. The IPO of a company with a bad IP situation would receive a bad rating, and conservative financial service providers would avoid this company, resulting in a low IPO price. Similarly, a good IP situation also leads to a better IPO price.

– **“Patents can help start-ups form joint ventures and R&D partnerships.”**

Yes. Without a patent application in place, it is very difficult to share technical information with other companies, even if an NDA is in place. A patent application allows you to enter a joint venture or partnership with confidence that your innovation is protected.

– **“Patents act as support for early stage marketing.”**

Yes, market share is only gained through clients who are willing to put money on the table. In order to find them, you need to start marketing activities from the very early stages of your start-up. Patents can then be used to safeguard the early marketing activities of an invention.

– **“IP is an indispensable catalyst for franchising.”**

Yes, IP (which includes patents, trademarks, designs, etc.) protects your franchising information from release into the public domain after it is handed over to third parties.

In my experience, franchise agreements can be strict. Very often, I have seen how franchisees usually want to escape from their franchise agreements, of course without stopping their businesses. So my ground rule for franchisers is: never start a franchise business without protecting it properly.

### **Poor Reasons for IP Protection**

Sometimes, I hear good reasons why start-ups need IP, but most of the time I hear utter nonsense. Here are some bad reasons for IP protection:

– **“Patents can help a start-up defend itself against attacks by rivals.”**

Nonsense. Repeat after me: A patent is a sword and not a shield against attacks. Patents are at best a mild repellent against competitors, and hopefully prevents them from copying what you are doing.

– **“Patents can help a start-up stop the theft of its innovations by larger rivals.”**

No, they will not. Well, yes they will, but only if your start-up can

afford the lawsuit. Otherwise, if a larger rival takes your innovation, it is a difficult situation unless you are willing to bring them to court. But there is no need to worry, as this does not happen very often. Your larger competitors are more likely to ignore outside solutions with an arrogant “not-invented-here” attitude, and they usually also have their own roadmap for technical areas.

– **“Patents can ensure a start-up’s freedom-to-operate.”**

No. In the first place, a patent can be a weapon like a sword, but it is not a shield. A shield will defend you against attacks, but a patent will not. It will not provide freedom-to-operate, as there are other obstacles. Sometimes, but rarely, a patent can be used to generate an expensive deadlock situation with a competitor. But the emphasis here is on “expensive”. And this deadlock is never predictable.

– **“Start-ups with IP achieve greater long-term success than start-ups without it. Firms without patent protection are much less likely to survive.”**

No, not true. Most newly set up companies do not have active IP at all. Ask your barber whether he had IP when he opened his shop. It depends on your ideas, and how innovative and valuable they are, as well as on your future customers. Are they willing to put money on the table for your products and services?

– **“Patents can help a start-up launch a billion-dollar empire.”**

No, this is the wrong business logic. Billion-dollar empires usually have patents, that is true. But most patent owners are not billion-dollar empires. Do not confuse causation with correlation.

## – “Start-ups need a protected logo trademark.”

No. Logos are for old, multi-billion-dollar firms. But these firms did not get any benefit from their logos in their first 20 or 30 years. As for new businesses, customers do not care what the company logo is. All they care about are the benefits provided, and maybe the company name.

Business names can be important for branding; and this is generally true if you run an online B2C business. In this case, you should trademark the name. A logo reinforces this name-identification illusion. But do not make the mistake of confusing logos with names! In the first place, what new businesses need are new customers and sales revenue. Do not waste money on protecting your logo.

## Industry Spotlight: IP in Construction

So far, we have only considered the micro view about how patents impact inventors and their product development. Now we take a look at how IP protection and infringement can play out within an entire industry, and how it affects larger business and industry decisions.

We will use the construction industry as an example. *Because it is a price- and time-competitive industry, IP protection can be a dealbreaker or dealmaker for a company's survival.*

Here are the major ways IP impacts construction businesses:

- IP costs: drives up total costs in an industry with already thin margins
- Injunctions, or Stop Work Orders: a court order forcing a business to stop work
- Inspections: where a patent enables us to inspect the construction site for infringement

- **Damages:** when a company has to pay its competitors for infringing their patents
- **Destruction:** the possible consequence where a company has to destroy its own building

We will focus on injunctions, because it is usually through an injunction for infringement that construction companies first experience IP.

## Infringements and Injunctions

Let's say you walk past a competitor's construction site, and something catches your eye. You notice some interesting and innovative use of building techniques and materials. In fact, they look like your own original ideas. Has the competitor stolen them? You start to get excited because you have a patent protecting those ideas, and the competitor has infringed your patent! You sense an opportunity—can you force the competitor to stop work on his site?

You call your patent attorney and file for an injunction. At this early stage of legal proceedings, you want to get an interim (temporary) injunction, issued by a court to prevent your competitor from working. It is similar to a stop work order. This is quite an extreme action, and would be a big blow to your competitor because schedules are very tight in the construction industry. However, getting an injunction is not easy, because you have to go to court, and the judge will run a few tests before deciding.

This is what a judge will likely consider:

- **Operative threshold.** We must show that there is a reasonable chance that the patent infringement is there, that you have a real prospect of succeeding in your claim of infringement.
- **Adequacy of damages.** This is when the judge asks, “If we give you



this injunction, you can stop the competitor from doing what you have patented. But wouldn't it be sufficient if I let him continue doing what he's doing, and he pays you damages at a later time?" And usually, my answer would be "Yes". A building sits there and cannot run away, so any actual damages can be asserted at a later time. Still, I would try to obtain an interim injunction, because there are strong reasons why an injunction should be granted. And as a fallback position, I would always request to be allowed to secure the relevant evidence while the building is under construction, because later it might get buried in five meters of concrete underneath the building.

- **Balance of convenience.** The court usually prefers to take whichever course carries a lower risk of injustice, if it should turn out to be wrong at trial. This means that the judge generally counsels prudence, and would say, "Let's keep the status quo." Did the patent owner know about the infringement for a long time? Did the defendant know about the patent without doing anything about it? Very often, when people ask for an interim injunction, they would have known that the infringement was ongoing for weeks or months; in this case, the chances of getting an interim injunction are very, very low.

So, as a patent owner, some creativity is required, as well as good knowledge of the legal, technical and economic systems, and of course IP experience.

But what happens if the court refuses to issue an interim injunction? What can you do?

- As a patent attorney, my fallback position is **to request an order for retention of evidence**. This means that the court will give us permission to inspect your competitor's construction site, and take all the evidence that we need to prove at a later time that he has infringed our patent. I

guarantee that this is a painful thing for your competitor.

- After that, we would go for a **full-fledged lawsuit**, claiming first “to destroy any patented product in relation to which the patent is infringed, or any article in which that product is inextricably comprised”. In this case, the patented products are buildings, and we are asking to destroy them. Because patents are legal rights, and if a competitor infringes them, something must be done. We can claim that just paying damages is not sufficient. This is your right as a patent owner. If destruction is too onerous, we could ask for “an account of the profits derived from the infringement” or “damages in respect of the infringement”, either or whichever is higher, so that your competitors will not make a profit from infringing your rights.

So be careful when you get your patents drafted. Make sure that they are drafted in such a way that at a later time, you can assert your granted patent against your competitors.

As a side-note, there is often a Reversal of Burden of Proof for product-by-process patents. So in some cases the alleged infringer has the burden of proof for not infringing your patent, which makes it more convenient for you as a patent owner to assert your patent.

## **Industry Standards vs. Patents**

*Who should own the ideas that govern an entire industry?*

A common type of ‘product’ in the construction industry is the standardized pre-fab building. Let’s say that these buildings are covered by 10-20 patents, as well as some standard building codes.

As the industry matures, this is what will happen. There will be a group of companies who each have some Standard Essential Patents (SEPs) that describe these pre-fab buildings. Imagine that the representatives of these companies come together in a meeting, to decide on prices, delivery

times, and who gets what projects. The most powerful is the one with the largest share of the patents, and he will be the most influential. Some companies have just one patent, so they are less powerful, but they can still participate. How about those with no patents? They are not allowed in the meeting. They are excluded from decision making.

What we have just described is a **cartel**. Patents are generally used to exclude the competition. But if they are used to the extent that the whole industry is influenced and price-fixing occurs by the powerful SEP-owning group, then there must be some balancing element. This is when the government steps in. They create a competition watchdog, or a competition commission, whose goal is to prevent cartels.

Specifically, a competition watchdog would look out for:

- Price-rigging
- Supply-rigging
- Conflicts of interest

As you can imagine, it is not difficult to run afoul of non-competition rules. All it takes is a group of strong players sitting around, talking about price fixing or delivery time rigging, and a jealous excluded player to formally report to the watchdog. You may or may not have been colluding, but the suspicion of doing so, plus some supporting evidence, is enough to trigger an investigation.

To prevent this situation, I would recommend that these strong players register a proper **patent pool**. A patent pool is a consortium of companies who agree to license their patents to one another or to third parties. This allows the consortium to set up transparent rules and licence fees for competitors who do not have industry SEPs.

Here are the players involved in a construction industry patent pool:

- the Patent Office: it grants patents

- the Construction Agency: it regulates the industry and sets standards
- the Public Development Agency: it oversees public development works
- Private Contractors: companies that do the heavy lifting
- the Legal industry: they draft, prosecute and assert patents; they also draft patent pool contracts that govern that whole industry
- the Quality Control industry: it maintains the industry standards

To draft a patent pool agreement, you will need a general lawyer, a patent attorney, and also a third person, **a competition lawyer**. Using an analogy from the medical sector, these roles are equivalent respectively to a general practitioner, a specialist surgeon, and an anaesthetist, whose job is to smooth the way.

But patent pools are not just for avoiding competition investigations. Over time, industries inevitably tend towards standardization, and patent pools put you in a position of power and safety.

Until maybe 10 years ago, construction was traditional, and patents were not very important. You simply built a building according to what the architect tells you. But now industrialization is taking off. Everybody is moving towards standardization, and building codes are being adapted to that standard. Companies have been filing patents, and soon they will naturally progress to unofficial patent pools. *This is because construction technologies are becoming more complex; to use them, companies will need access to the complementary patents owned by other companies.*

With all the patents that are going to be established in the coming 20 years, cartels will form and power shifts will take place. This will happen anyway, so you might as well take control, file for patents, and formalize a patent pool, so that you can influence the industry.

I have personally seen this happen in the waste incineration industry. And this pattern is repeated in established industries like semiconductors, mobile phones, cars and aircraft, or any industry with sufficiently complex technology requiring standardization. Are you in a fairly IP-young industry like construction? When

it comes to IP, it pays to pay attention to the overall big picture.

Do not worry about the level of detail we got into in this section. In general, your patent attorney will know what to do. I am just explaining how the process of patent protection looks like in a specific industry, where you might not have thought there were patents involved.

## **NDAs: Good or Bad?**

### **NDAs are Everywhere**

It is common practice these days, when parties share confidential information, to have a non-disclosure agreement (NDA) in place. The average person will tell you that an NDA is:

- a deterrent from copying
- an ice-breaker
- a trust maker
- prevents the exchanged information from becoming prior art for the subsequent filing of patent applications, and
- prevents abusively published information (this is confidential information that is disclosed, breaching the NDA) from becoming prior art for the subsequent filing of patent applications

These are common perceptions, but in practice they do not work. What *is* true, is that an NDA forces the parties to switch on their common sense, and perhaps get a stronger protection like a patent. Basically, the necessity of an NDA should show you that you have something valuable to protect; and before you give it away, I strongly recommend that you file a patent. Because if NDAs are broken, it never works to sue the other party in court.

### **NDAs are Weak Protection**

Why is it that you cannot use an NDA to successfully sue someone?

NDA's have the following weak points:

- **Burden of evidence.** The one who asserts a claim needs to prove that the other party has committed the breach of confidence. This means that even if the other party broke confidence about your invention, you are the one who needs to prove it in court.
- **Calculation of damages.** Can you quantify how much damage was caused by the breach of an NDA? Whatever number you choose, the other party will likely refute your claims. Remember, the burden is on you to prove the extent and cause of damage.
- **Are all parties involved bound by the NDA?** No, often they are not. I had a client who met with his customer to share confidential information covered by an NDA. The client had a freelancer sit in the same meeting, but forgot to include him in the NDA. The next day, the freelancer published all the confidential material and we could not do anything about it.
- **Which part of the exchanged information falls under the NDA and which does not?** Very often, the NDA has such a broad scope that it covers everything. So even though there may be new information protected, there is usually also information already in the public domain that does not benefit from protection. You cannot just make something confidential by putting it under an NDA; the information itself should not already be in the public domain.
- **Abusive parties try to sneak in obligations that go beyond the scope of an NDA.** I have seen all sorts of nonsense hidden in NDAs by unscrupulous parties, that go beyond confidentiality. These can be distribution agreements, fixed prices or some share of future sales revenues.

This abuse of scope actually weakens the NDA by rendering it useless.

- **Unfocused NDAs can be considered anti-competitive.** This is another example of an NDA that does not hold up well in court. It usually contains too-broad, unfocused statements about the information to be protected, e.g. “all future developments based on the exchanged information”, which a court may consider anti-competitive.

## **Practical Solutions for Confidentiality**

So, what is the best way to protect your ideas? A practical solution contains these ingredients:

- A minimalistic NDA. One page is good enough.
- File a patent application for all important exchanged information. Keep this secret.
- Use common sense. Disclose only on a need-to-know basis.

NDAs can be deterrents. They are part of the usual business process. But they are limited and weak in many ways. You need to know their limits, and how to use them as part of a larger IP strategy.

## **Summary**

In this chapter, we learnt that:

- Patents are the type of IP you are most likely to encounter. They protect ideas that are novel, inventive and have an industrial application.
- Patents are powerful. They can act as weapons to sue others for infringement and as deterrents to your competition and third parties.
- Few people fully understand how patents work. Hence, there are

many misunderstandings about what patents can do.

- Start-ups will very likely need IP protection if they have innovative technology that needs to be protected and have attracted investor interest.
- There are many strategies for filing patents, depending on your budget and specific goals. Notable alternatives include not filing a patent at all, or doing a defensive publication.
- Start-ups tend to make some big IP strategy mistakes:
  - They file too narrow a patent, allowing competitors to invent around them.
  - They file only to protect a specific invention, not the various potential uses of the invention.
  - They wait too long to file for the next generation of products, allowing competitors to block these products with their own patents.
  - They file too late, letting competitors get an earlier priority date for foundational inventive concepts.
- There is a process of prosecuting injunctions and patent infringement. We also learnt about industry standards and patent pools, within the example of the construction industry.
- Non-disclosure agreements (NDAs) are commonly used to share confidential information. But they are weak and limited. They should be used as part of a larger IP strategy.



# Market Validation

## Getting Customer Response and Money on the Table

### Introduction

In the previous chapter, we looked at common patent strategy mistakes and myths, and if start-ups actually need IP. We also examined how IP and competition works in the construction industry, and the use of NDAs for protection.

Now we come to our fourth and final tactic, market validation.

This Chapter will answer the following questions:

- How can you tell if customers want your product?
- Why is it important to get information about market demand?
- Why is this important at every stage of product development?
- When should you start marketing activities?
- What is considered a successful market response?
- What happens if customers are not interested?
- What are general marketing principles you should always keep in mind?

### Inventors Are Terrible Marketers

One of the great curses of life is to be an inventor. It is almost as bad as being a gifted musician. Inventors will spend their life being frustrated and disappointed.

“But I work so hard!”

Warning: It does not matter how much work you put into a product. What matters is how much money buyers are willing to pay for it. You only can make money by selling products that a customer wants to buy. And selling only works when you are in front of them, at exactly the time that they are ready to buy. *Marketing is all about finding out what people want, and selling exactly this to them, when they want it.*

Many inventors ignore this principle. They ignore what the market

needs. They would rather go bankrupt trying to sell their new invention instead of testing the market for actual demand.

This is the standard mistake of an inventor: he invents a new product, and is convinced that the world will want the product. Why is he convinced of that? Because he has invented the product. He is convinced of the impossibility of making a financial mistake. After all, he was smart enough to invent the product.

For decades, I have seen inventors make this mistake. They start out convinced that there is a market. *But they did not test the market response before coming up with their product idea.* Instead, they are determined to create a market for their product, even if it means throwing away their money on the high costs of educating customers.

I can tell you that this usually does not work. It is difficult to change customers' spending habits. They will only change if you can find a compelling reason, but that takes more money than inventors have.

Most inventors do not want to hear this truth. That is why they are frustrated. They are terrible marketers who know nothing about marketing.

What is the likely outcome for the average inventor, who comes up with an idea off the top of his head, and who is determined to persuade others to buy his invention? Well, at some point he runs out of money, and maybe someone might pay him some small change for his technology and know-how. Or a competitor could just sell the same product without paying him a licence fee. At this point, the inventor will not have enough money to assert his patents against anyone copying his ideas.

So inventors cannot afford to ignore marketing. They *must* prioritize getting sufficient market response, in order to understand their actual market and customers.

## Getting Market Response

At every phase of product development from idea to finished product, we want to get clear, quantified information about the market. This

means *taking action to elicit response from our customers, to improve our understanding of what they want, and using that as feedback to improve the product as it enters the next phase.*

How do we get customer response? *We perform various market validation tests.*

## **What is Market Validation?**

Market validation is an evaluative process of talking to people in your target market, to test your product concept against a potential target market. It may include marketing activities like customer outreach, forming strategic partnerships, and raising awareness of your product.

## **Why Validate Your Market?**

In Part B, we looked at the recommended Product Innovation Cycle.

If R&D develops the product, freedom-to-operate studies teach you whether the product is viable, IP protects the product, *then market validation will tell you if there is demand for the product.*

Why should you validate your market?

- **It lowers your risk, by making it easy to stop and cut your losses.** You focus on getting early proof of demand, through successful sales at the intermediate phases of product development.
- **It gives you new information about market demand.** By consistently talking to customers, you will be up to date with their changing needs. With verified customer input, you can make informed decisions about changes to your product.
- **It teaches you about the mindsets of potential customers.** You get a reality check, because market mindsets might differ from your own. With a realistic understanding, you can better meet the challenge of

educating potential customers about your product.

## When to Validate the Market?

In Part C, we looked at how companies usually *fail to integrate their R&D with market validation at an early stage*.

What occurs is that the product is developed, fails because there is no natural demand, then goes back to again to be reborn as product v2.0. It starts a vicious cycle of “cash infusion > new product development > market failure” over and over, creating a zombie product that refuses to die a natural death.

When do you - yes you - validate the market?

- **As early as possible.** Start doing market validation immediately after you have an idea. Do not wait until you have a finished product.
- **At every intermediate phase.** Your product adds inventive concepts and changes over the idea, conceptual model, prototype and product phases. The ideal customer and market will also similarly evolve. You better iterate the product based on the response at every phase.
- **Stop product development if market validation is unsuccessful.** It is much better to stop early and cut your losses, than to continue developing a product that nobody wants.

## How to Validate the Market?

We have seen what market validation looks like in successful product development.

This involves getting *quantifiable customer interest, proven by actual pre-sales interest and/or revenue*, depending on the product phase. If you cannot get sufficient interest, then it is time to either adapt or kill the product.

So how do you validate your market?

- **The proof of customer demand is money on the table.** We recommend

that you focus on getting letters of intent at the idea phase, paid reservations at the conceptual model phase, paid pre-orders at the prototype phase, which will likely lead to paid orders when the finished product is ready. By aiming for these milestones, you have well considered “go/no-go” points where you can decide to proceed or stop product development.

- **Do it safely, while under IP protection.** To find paying customers before your product is ready, you need to start marketing activities from the very early stages of your start-up. To protect the novelty of your ideas from being copied by competitors, file patents for each new inventive concept.
- **Plan and prioritize your marketing.** Do not prioritize your technical implementation over marketing. Plan and budget for marketing from the beginning. Try not to outsource this function—get a marketing professional for your core product team, so that you get first-hand feedback from your target customers.
- **Be strategic about your marketing activities.** Most businesses do marketing inefficiently, as a form of customer outreach. As a start-up, you should *only do marketing activities that will generate measurable market response*. We will show you how in the next few sections.

## General Principles

To summarize:

- Never build what you think that the market needs.  
*Instead, always build what people want and what they are willing to pay for. Do not develop your product in a vacuum, always get customer feedback.*
- Start with marketing at a very early stage of product development.

*If you can, start doing market validation immediately after you have an idea, and at every intermediate phase until the finished product. Iterate the process.*

- Prioritize marketing, and be strategic and aggressive.

*Connect marketing to sales—all marketing activities should be focused on getting money on the table. And make sure your product has IP protection.*

## **An Expert View on Marketing and Product Development**

I am not the only one who thinks that market validation and marketing are important.

Karl Ulrich and Steven Eppinger at the Massachusetts Institute of Technology (MIT) have written *Product Design and Development*, a famous textbook that explains product development methods aimed at bringing together the marketing, design and manufacturing functions of a business.

Here are their thoughts on marketing:

### **Core Product Development Teams Should Include Marketing Professionals**

What is the composition of an ideal product development team, for say, an electro-mechanical product of modest complexity?

In the centre is the Team Leader. Around him are the team members we would consider essential for the design and manufacture of the product: the specialist roles of Electronics Designer, Mechanical Designer, Manufacturing Engineer and Purchasing Specialist.

But, the core team also includes an Industrial Designer, because customers only purchase attractive products. And, perhaps surprisingly, a Marketing Professional, who is present at the early stages of development, despite having very little obvious input on product design and manufacture. The

core team is supported by secondary functions of Finance, Sales and Legal, and external suppliers.

Now this is an ideal team composition for a big company with many resources. Start-ups should try to match the same functions, but the problem is that they have limited resources. *While start-ups can outsource Finance, Sales and Legal, they often write off Marketing as a non-essential, at least until the product is developed.*

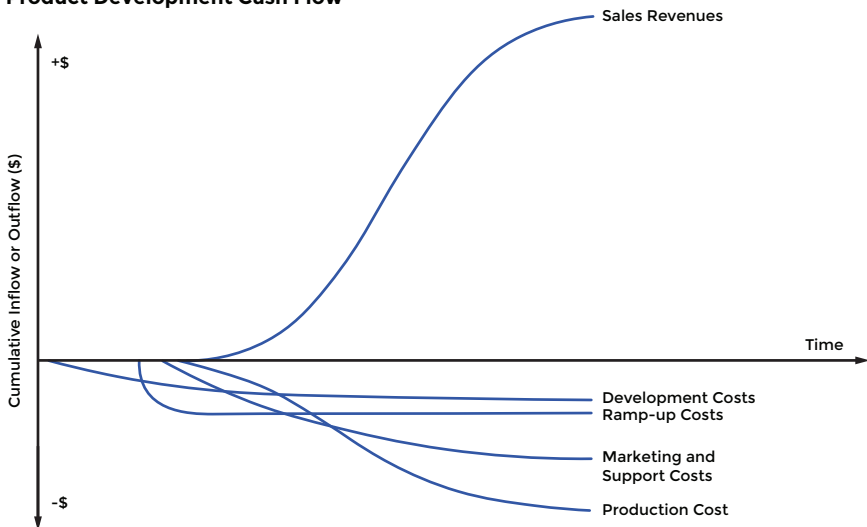
Try not to do that. In this case, I strongly agree with the MIT experts that you need a marketer in the core product team.

## Product Development Cash Flows Should Plan for Marketing Costs

The book also includes a chapter on the economics of product development, from which I have extracted this graph.

It shows the typical cash flows for a successful new product. Successful

**Product Development Cash Flow**



in this case means that there are revenues greater than the costs.

As you can see, sales revenues only start after the product is ready, but costs start much earlier. Development costs start at the beginning and increase until the product is developed. This follows by a quick increase in ramp-up costs and production costs, for manufacturing of the product. And then we have marketing and support costs, which seem to start a short time before the product is available.

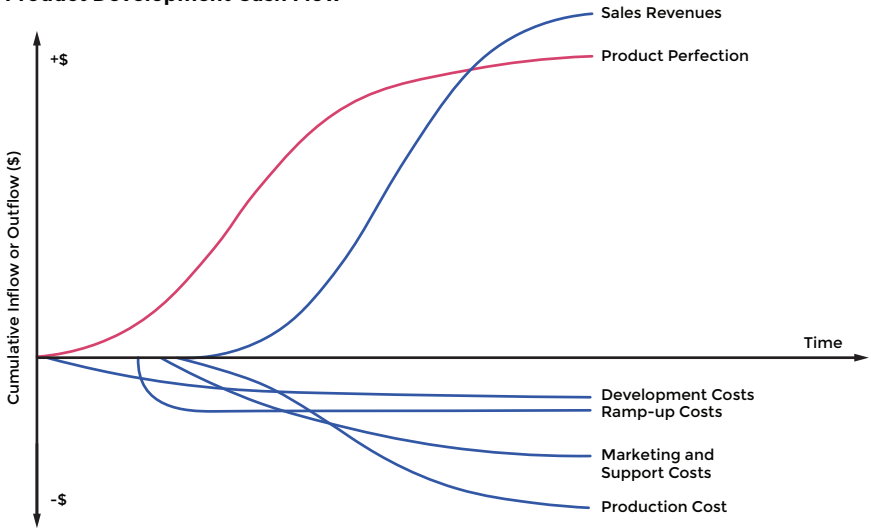
Do you recall our product perfection curve? It shows the evolution and increasing perfection of a product through its development phases.

We will overlay the cash flow curve with the product perfection curve.

They match pretty well. (Minus an offset delay in sales revenue, of course, because it takes time to sell.)

So yes, this looks like an accurate description of good product

#### Product Development Cash Flow



development, where product perfection has been validated by actual sales revenue, while including marketing as well as the more obvious



development and production costs.

## Dangerous Hidden Assumptions

Still, these experts are engineers and professors at heart, and therefore quite theoretical. They seem to have gotten it right, but their ideas contain at least one wrong assumption.

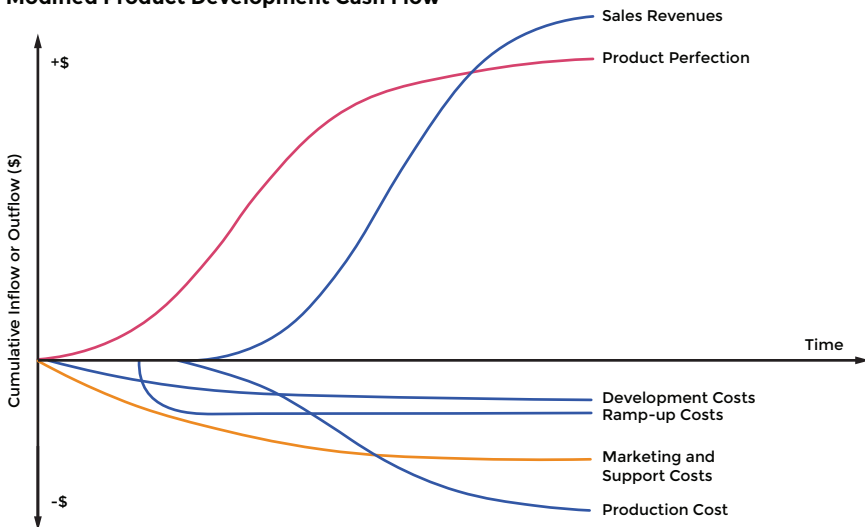
If you look closely at their curve, it seems like marketing starts around when the prototype is ready.

I think that these experts are too optimistic. In real life, busy start-ups can plan to start marketing at the prototype phase, but will very likely delay it until the product is ready. The thing is: *marketing is never seen as urgent. It is easy to continue putting it off. If you actually want marketing to happen, you must allocate resources to it at the beginning.*

My ideal cash flow curve would look like this, where marketing starts as soon as you have the idea:

Sounds revolutionary? Maybe. But this is about planning around

### Modified Product Development Cash Flow



human psychology. It is hard to pay attention to something that is important but not urgent. That is why you must consciously choose to take action on marketing from the start.

Why would they make this mistake? I think that they suffer the following unconscious assumptions:

- **They value marketing, not market response testing.** Marketing activities should be for the purpose of generating market response. These concepts overlap and use the same tools, but have different intended outcomes. Even their choice of language, using “marketing professional” instead of “market response professional”, shows their underlying mindset.
- **They underestimate the importance of marketing as a means of problem solving.** Imagine a marketer coming in at the prototype stage. He was not part of the early R&D process. He would not have a deep understanding of the value proposition and other product issues that have already been solved. He would have missed out on problem solving during the important ideation phase. Would he be able to foresee potential problems that require a marketing solution? I do not think so.
- **They did not give marketing a place in the original business plan and budget.** If marketing comes in only at the prototype phase, the danger is that it can be perceived as an expensive add-on. Existing team members may ask unpleasant questions about expending limited resources on marketing instead of product. Also, humans form tribes—if marketers join late, the core engineering team may perceive them as outsiders and possibly ignore their advice.

None of these assumptions are really bad. But added together, their

impact is significant. As an inventor, you must have a mindset that prioritizes talking to the customer and getting valuable feedback as early as you can. Anything less is a potential recipe for failure.

## Marketing Principles for Start-Ups

Here is an overview of basic principles and concepts to plan your marketing activities.

### The Goal is to Increase Revenue

In a start-up, marketing and sales go hand-in-hand. Because resources are few, you need to be very focused on a single goal: increasing your sales revenue.

There are only three ways to do this:

- Sell at a higher price
- Sell more to existing customers
- Find more new customers

Most people focus on finding more new customers. They neglect the first and second options, which is to sell at a higher price, and to sell more to existing customers. This is a mistake. *It takes more time, effort and resources to acquire a new customer, compared to upselling to an existing customer to whom you have already proven your value.*

I believe what holds people back, especially from selling at a higher price, is the fear of rejection. This is a mental block that we all have. But we must learn to live with it, be aware of it, and not allow it to distract from our goal.

### Spend the Right Amount on Marketing

A further common problem with marketing is overspending or under-spending. Both are not good outcomes, because it means you did not hit your marketing targets.

What you need to do is *find out the lifetime value of a customer*. This is a prediction of the total amount of money a customer will spend on your company during their lifetime.

I will give you a basic example. Let's say that you are a very large company. Assume that you have a large enough statistical sample of existing customers, which allows you to calculate the average revenue made from a single customer. Further assume that your average customer brings in a revenue of \$750. If your contribution margin is over 50%, you know that you can spend a lot more money acquiring new customers. Even \$100 spent for each new customer is not an exceedingly large use of your marketing budget.

Here is a more detailed example. Let's say you sell T-shirts at an online store. Through website advertising, you spend on average \$10 to acquire one new customer. Each customer buys an average of 4 shirts every year, for 5 years. Each shirt is priced at \$30, so your average customer will bring in \$600 in revenue over his "lifetime" with your company. Assume that your costs for production are about \$400, or two-thirds of your revenue. So you know that you can spend an absolute maximum of \$200, or one-third, on marketing to acquire one new customer and still be profitable, depending on your other costs.

With only \$10 used, it is likely that you are currently underspending on marketing. You could have been spending more, perhaps using other channels, targeting different groups of customers, or running campaigns to upsell to existing customers.

If you never calculate the lifetime value of a customer, you will never find out whether you have spent enough money for your marketing.

## **Choose the Right Marketing Approach**

So now that we know how much we can safely spend, where should we put our marketing dollars?

Most marketing people will tell you to spend it on some form of

**unidirectional advertising.** These are marketing channels that create a one-way connection, and address the audience without actually engaging them further. An example would be a paid newspaper or TV advertisement.

Another popular marketing method is **public relations**, or PR. You get audience attention by convincing the editor of a newspaper or media outlet to write positively about your company. Again, this approach is unidirectional because there is no back channel for getting an audience response.

Next, we have **direct marketing**. As a start-up, this is what you should focus on. In contrast to the earlier channels, direct marketing means *that there is a back channel; our advertising will generate feedback from the customer*.

For the sake of completeness, the fourth way of doing marketing is **referral marketing**, also called word-of-mouth marketing.

I can tell you right now, that you should ignore unidirectional advertising and PR because you cannot calculate your return on investment (ROI). *You should spend your resources on direct marketing and on referral marketing.*

## Quantify Your Marketing With Sales Funnels

Sales and marketing is a numbers game. It is easy to get overwhelmed. Having a sales funnel gives you a realistic picture of the numbers involved, and a process of dealing with customer interaction in a structured way.

What is a sales funnel? It is like an inverted cone, very broad on the top and very narrow at the bottom. At the top are the leads we generate. A lead is a person who indicates some interest in buying your product. We start with a large number of leads, whom we contact, and turn them into opportunities. The opportunities will go through a series of sales stages, such as *prospecting, qualification, needs analysis, proposal and price quote, negotiation and review*, and, finally, a closed *won* or a closed *lost*. This means that we either got the deal or not. But to get there, *a potential customer needs to be contacted an average of 9 times before the deal is closed.*

Let's put in some sample numbers to understand better. We generate

100 leads, perhaps from our website landing page. After prospecting and qualification, these turn into 50 opportunities. After contacting these 50 opportunities, figuring out what they need, explaining our product, drafting a proposal, and negotiating on prices, we would have gone back and forth around 9 times each, for a total of 450 interactions. And then we end up with 5 closed deals won. This is a typical figure. So, *100 leads are converted into 5 sales (a 5% conversion rate)*.

What do we need to do if we want to get 50 sales? Working backwards, we need to have 500 opportunities, and therefore 1000 leads.

And this is why marketing and sales is serious work. In order to generate sufficient leads to funnel down to the desired sales numbers, you will need an investment of effort and proper software tools.

## **Optimize Your Campaigns With A/B Testing**

Imagine that you are a shepherd with 500 sheep. You have to buy sheep food, but you want the best investment of your money. Given that your sheep have a variety of dietary preferences, how do you choose the best?

Let's say Food 1 has a certain cost; so does Food 2. To optimize the distribution of food, we provide both foods at the same time and see what happens. In other words, we let our sheep decide.

After some time, it seems that 350 sheep prefer Food 1, while only 150 sheep prefer Food 2. So Food 1 is in demand by the majority. But we do not stop here. We replace the less popular Food 2 with Food 3, and let the sheep decide again. We run this process as often we need, to optimize our investment in sheep food. This iterative process of comparison and optimization is known as A/B Testing.

The same principle applies to how you allocate your resources in marketing. You split your marketing budget into two, and spend the first on Campaign #1, and the rest on Campaign #2. You continue with the winning campaign, and re-allocate the resources from the less effective campaign.

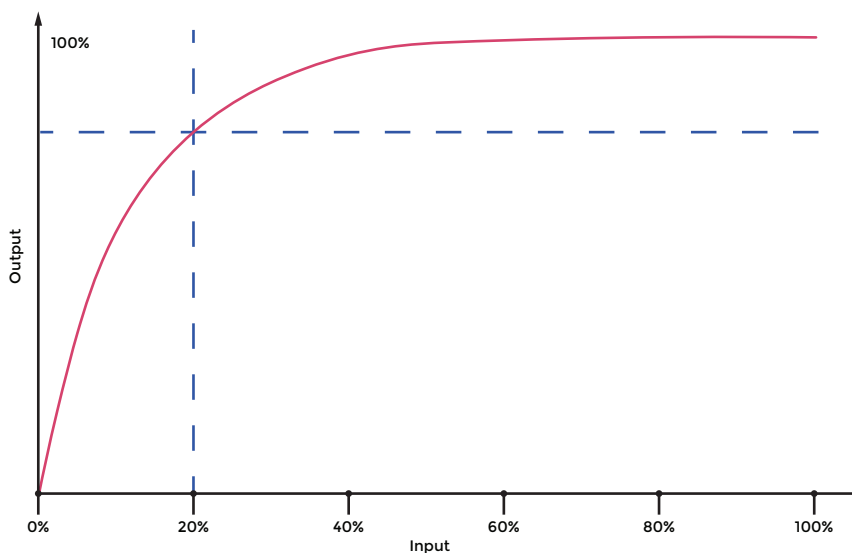
Unlike hungry sheep, marketing campaigns are intangible. That's why

*all marketing activities should have return channels for customer response.* Otherwise, you cannot measure the effectiveness of individual campaigns and compare them to each other.

## Prioritize With the Pareto Principle

The Pareto Principle is a prediction that 80% of effects come from only

### Pareto Principle



20% of causes.

This curve illustrates the idea: while obviously 100% input will generate 100% output, the blue line shows that just 20% of input is responsible for 80% of the output. The system is at an optimum here. But after the first 20%, it takes a lot more input to get just a little bit of extra output. This is related to the law of diminishing returns, where beyond a certain point, more effort does not give you significant returns.

What this means is that we must prioritize what we do, and not waste

time on areas that are not high value.

We can use this principle for generating, profiling and screening leads, for allocating marketing budgets, for dumping customers (yes, we will need to dump customers) and for optimizing our work time. These are just some applications of the Pareto Principle in our lives.

## **Get the Right Software Support**

Direct Marketing requires software, in order to measure customer response.

Here is an overview of the likely software you will need:

- Customer Relationship Management (CRM), to deal with the large numbers of potential clients, especially when using sales funnels
- Landing Pages and Google AdWords services, which boost the effectiveness of your website as a sales tool
- Google, Facebook and LinkedIn Analytics, for determining your ROI on these channels
- Email Campaign software, and best practices for delivering actual value to your targeted customers without spamming them
- SMS and Messenger Campaign software, similar to emails
- POS systems, for businesses in the retail sector

## **Advanced Marketing Principles**

How can we improve upon the basic marketing principles above?

You will need some extra skills in your marketing toolkit. These are things like:



- Targeting your audience, to improve the selection of your preferred leads
- Positioning yourself better, to address fewer but more relevant people in the audience, which will improve your conversion rates
- Developing a Unique Sales Proposition (USP), that differentiates your product from your competitors
- Creating a Limited Market Entry, which gives you access to a market that your competitors do not have.
- Copywriting, which is all about creating persuasive texts that are designed to attract your preferred audience.

These are just some of the skills you should know. We will get into detail about these marketing principles and other advanced marketing concepts on my website [www.ip-lawyer-tools.com](http://www.ip-lawyer-tools.com).

## Summary

In this chapter, we learnt that:

- The average inventor prefers to ignore marketing. They make the mistake of not testing market response before coming up with their product idea.
- To understand what customers want, you need to elicit a response from them. You then use their response as feedback to improve your product as it enters the next phase.
- This lowers your risk, by making it easy to stop and cut your losses. It also gives you new information about market demand.

- Do your market validation as early as possible. Do it at every intermediate phase because your ideal customer and market will evolve as your product develops. Stop product development if market validation is unsuccessful.
- Successful market response is quantifiable, proven by actual pre-sales interest and/or revenue. If you cannot get sufficient interest, then it is time to either adapt or kill the product.
- Core teams for product development should include marketing professionals from the beginning. Cash flows for product development should also plan for marketing costs at an early stage. Do not underestimate the urgency of marketing.
- There are important basic marketing principles for startups. In general, be strategic by connecting marketing to sales. Prioritize high value outcomes. All marketing activities should focus on getting money on the table. Make sure that marketing activities have return channels for customer response.

Visit [www.bit.ly/4x4-rules](http://www.bit.ly/4x4-rules) for Part C updates and discussion forums.

## **Part D The Consequences**

### **The Importance of Getting It Right**

The transcendent power of innovation naturally leads to the hierarchy of our Innovation Strategy, the rules of our four innovation tactics, and now, the consequences of your actions.

But consequences do not show up immediately. Success is the result of many good decisions taken progressively over time. Similarly, failure is the culmination of many bad decisions.

Depending on the decisions you make, the outcome could go either way.

Visit [www.bit.ly/4x4-consequences](http://www.bit.ly/4x4-consequences) for Part D updates and discussion forums.

## Two Inventors, Two Outcomes

### Live Or Die With Your Innovation Strategy

#### Gene's Failure

Remember Gene from Part A, page 24? He was a really smart guy who invented a brilliant new product with the potential to disrupt an entire industry.

But at every step of the 4x4 Innovation Strategy, he made bad decisions:

- **R&D.** He focused only on the technical aspects of product development and did not talk to customers to validate his ideas. Also, he could never finish his R&D and get his product out to market.
- **FTO.** He was not interested in whether it was commercially safe to sell his product. He did not pay attention to potential infringement risks, or important legal and business constraints like country laws and industry regulations.
- **IP.** He filed an initial patent application but did not protect the improvements of his invention, ending up with a limited scope of protection. He acquired granted patents in multiple countries without doing research about market demand, and without having a plan for sales and market entry. He wasted more money by registering trademarks he did not need.
- **Market Validation.** He waited until his product was finished before starting his marketing. As a result, he did not understand his potential customers, nor if there was market demand. He had no sales strategy. He also did not plan for investors. So he ended up with no revenue, no customers, and no investors.

His story is especially painful because his entrepreneurship journey

was a train wreck. He failed not because his invention was bad. He failed because from the beginning, he constantly made bad decisions in strategy and tactics.

Individually, these decisions do not seem serious, but when added up over time, they inevitably result in failure of the worst sort—bankruptcy, which means game over for an entrepreneur.

## Andy's Success

Here is the story of Andy, another inventor. Andy invented a new optical testing system used in the making of pre-cast concrete buildings.

His is a story of success, because Andy avoided all of Gene's mistakes.

- **Andy had the right team from the beginning.** Andy knew that he was a perfectionist engineer, and so he partnered with Peter, a flamboyant sales character who understood the market, and Mike, an analytical manager who was organized and got things done. From that onwards, he always had help. His core team was a mix of complementary personalities and skill sets. **Gene started out alone, and stayed alone throughout.**
- **Andy had a realistic strategy. He was willing to plan and listen to expert advice.** Andy did his homework, by identifying the phases his innovation would go through. The core team would make sure that their actions aligned with their desired outcomes. For every product phase, he and Mike would set aside a realistic time plan and budget, and Peter would reach out to his business network to determine interested market segments. If Andy got over-enthusiastic about the technical aspects, the others would bring him back to reality. All decisions made were based on knowledge of their competitive landscape. **Gene lived in a dream world, had no plan, did not listen to anyone, and did not care about understanding his competitors.**

- **Andy’s R&D focused on what the market needed, and adapted the product accordingly.** His original product was an optical testing system meant for swimming pool tubs. But Peter did market response tests, and realized that there was an untapped market—building contractors who wanted a testing system for documentation to defend liability claims by their developers. So the invention ultimately served to make buildings. Without getting actual input from the market, Andy would never have realized that. **Gene stuck with his original idea, and never adapted his product to actual market demand.**
- **Andy’s R&D process was also efficient and timely.** Mike mediated between the conflicting tendencies of Andy (product development) and Peter (sales). Often, Peter would find paying customers for early iterations of the product, but Andy would not be willing to sell the product until it was technically flawless. Mike would then convince Andy not to wait for a perfect product, and also persuaded Peter to not promise more than what they could deliver. If he had to, Mike would tear the product out of Andy’s hands and deliver it to paying customers in time. **Gene had nobody to force him to deliver a finished product.**
- **Andy had a comprehensive FTO from day one.** Andy, Peter and Mike checked existing patent publications to see if there was any possibility of infringement. They also checked for other business and legal issues like regulations and compliance. In addition, they researched potential obstacles, including hostility of competition, bad publicity, potential legal threats like product liability, lack of formal user training for device users, and dealing with device replacements, among others. All this preparation came in handy when Peter talked with potential investors. It generated trust and showed investors that the team knew what they were doing. **Gene had zero FTO.**

- **Andy had a solid IP protection strategy and a patent attorney with the right technical background.** Andy would note down every new inventive concept in a growing patent application document. Before entering the next product phase, he would secure a filing date by filing the document with the local patent office. Andy's patent attorney was supportive of filing makeshift patent applications at an early stage without putting too much work time in, thus keeping costs down. This patent attorney also had an engineering background and previously worked as an R&D engineer in electromechanical measurement systems. So from a technical point of view, both of them were speaking the same language. Together, they made sure to file a litigation-grade PCT patent application for the four main aspects of his invention before the end of the priority year of his first patent application. **Gene had zero IP strategy, and also listened to bad advice, filing expensive patent applications that had little or no value because they were not in line with his actual product.**
- **Andy did market validation using specific marketing techniques with the goal of generating customer response.** Peter was an expert in online marketing, and the first thing he did was to set up a landing page with information about the intended product on the company website. They referred to this often when talking to potential customers and investors, thus saving a tremendous amount of time. Later, close to the launch of product v1.0, the landing page allowed them to collect the contact information of interested customers, in return for allowing them to download useful information about the product. That helped build up their email lists for later marketing purposes. **Gene ignored all marketing activities.**
- **Andy talked to customers and investors from the beginning.** Peter and Andy were aggressive in meeting people. They wanted to achieve

maximum penetration of their target market. They attended trade shows where they met many potential customers. After, they would follow up with these people over LinkedIn and exchange emails, slowly building a relationship of trust. Within only a year, Peter had built up a database with 5,000 leads, from both potential customers and investors. **Gene ignored potential customers and investors.**

- **Andy’s “bottom up” approach of first doing market response testing before developing the product led to strong investor interest.** Peter leveraged his database with the help of a commercial CRM system. He could commit full-time to fundraising and sales, because there was Andy to develop the product and Mike to meet the deadlines. Peter put in an incredible amount of sustained effort, spending about 1,400 working hours over only four months, contacting and pitching more than 3,000 investors, and performing due diligence and term sheet negotiations. He was so busy that he had to hire two assistants for that. As a result, the team achieved investment of \$1.5 million, before their product v1.0 was even ready. Their fundraising triumph made Andy realize that the success of their start-up was determined by their own financial inertia, and not so much by the quality of their product, as he had initially thought. **Gene could not attract serious investors because there was no product to show, nor any existing relationships of trust.**

Everything is connected. Gene was aware of the innovation tactics, but he applied them (or not) at the wrong time or badly. Gene’s approach was piecemeal, and never came together in a cohesive strategy.

Andy from the beginning had a clear long-term goal and a well-defined strategy, and applied every innovation tactic in an efficient and effective way towards that end.



## Facing the Consequences

Failure of some sort is inevitable on the entrepreneurial journey. Nothing is perfect, and not everything will go your way.

The difference is: do you want your failure to be low risk and contained, so that you can cut your losses and focus your energies on something else with a higher chance of success? Or do you want your failure to be slow and drawn out, like a zombie company that sucks out your life over years, leaving you with nothing?

Failure can be cheap or expensive, and my hope is that this book has shown you how failure can be turned into a success.

Remember, innovation is a transcendent power. It comes from nature, and has inherent hierarchies and rules, which come with consequences. If you go against these rules, nature itself will punish you. But if you follow them, and learn to surrender to the intrinsic values of the system, you will receive its blessings.

Visit [www.bit.ly/4x4-consequences](http://www.bit.ly/4x4-consequences) for Part D updates and discussion forums.

## **Part E: Conclusion**

### **The Forest and The Trees**

To me, innovation strategy is like a forest, and innovation tactics are the trees.

If you see only the big picture forest, you miss out on the many details that require attention. This happens if you have a strong vision for your idea, but no clear plan to bring it to market.

If you focus only on cultivating one tree, you risk ignoring the rest of the ecosystem. This happens when you prioritize product over marketing, or IP over FTO.

And as in any natural system, the laws of time must be followed, and slack is not permitted. This cannot be said often enough.

Everything is related. Everything functions within a well-ordered system. Successful innovators need to be able to switch their perspectives as needed, and use the right tools at the right time. And don't waste time.

Visit [bit.ly/4x4-conclusion](http://bit.ly/4x4-conclusion) for Part E updates and discussion forums.

## **A Call to Action**

### **Empower Yourself Now**

I have walked you through the forest that I have been farming for the longest part of my life.

By reading this book, you have taken a guided tour through some fairly complex ideas. You may be able to harvest a rich crop from the forest. You may be able to zoom in on single trees and grow them well. You may get lucky. Or you may not.

I will not lie. Success in innovation is statistically uncommon; at most one in a hundred innovations achieve economic success. The possibility of failure lurks around every corner.

But my hope is that you will take the lessons you have learnt in this book, and apply them to your ideas, your products, your team, and your business.

The key concept I want you to remember is the 4x4 matrix at the heart of my innovation strategy. It sets the order of what you should do, through specific tactics that you apply at specific points over the course of your product development cycle. Please note that time is crucial, complete the products development cycle in less than a year.

By following these guidelines, you will be better equipped to navigate the intricate forest of innovation. With these basic tools, you will find it easier to systematically discern between innovations with a higher chance of success, and innovations for which the time or circumstances are not yet right. This will reduce bad decisions, eliminate unnecessary pain, and possibly even save the life of your company.

By following the template of my 4x4 Innovation Strategy, you will find it easy to attract investor interest, because you will be prepared with the answers to all of their questions.

And with an in-depth understanding of the different parts of the forest, you will find it easier to work with product developers, marketing professionals and IP professionals. You will understand how these specialists

Recommended Product Innovation Cycle

	Idea	Conceptual Model	Prototype	Product V1.0	Total Stage Cost
Research & Development	\$5,000	\$25,000	\$125,000	\$1.25m	\$1.405m
Freedom-to-Operate (FTO)	\$5,000	\$5,000	\$10,000	\$15,000	\$35,000
IP Protection	\$5,000	\$5,000	\$5,000	\$15,000	\$30,000
Market Validation	\$5,000	\$15,000	\$45,000	\$170,000	\$235,000
	<b>A</b> Sub-Total \$20,000	<b>B</b> Sub-Total \$50,000	<b>C</b> Sub-Total \$185,000	<b>D</b> Sub-Total \$1.45m	<b>Total \$1.705m</b>
Results/Outcome	3 Letters of Intent	3 Paid Reservations	3 Paid Pre-Orders	3 Paid Orders	Thorough FTO + Early Patents

think, which is essential because innovation includes many sub-disciplines. Any good university course will establish a theory that can and must be applied in practice. Right now, this book explains the theory of the 4x4 Innovation Strategy. In fact, I have shown you a good part of my theory and toolkit as a patent attorney. You can already start using it. But in future, there will also be an Entrepreneur Edition, which will take you step-by-step through applying the theory to your own innovative idea, in the form of worksheets and other material.

If you have more questions about innovation strategy, intellectual property, or entrepreneurship in general, help is available in many forms. The best place to start is my website [www.ip-lawyer-tools.com](http://www.ip-lawyer-tools.com), which has extensive training courses you can take, stories about inventors and entrepreneurs, as well as an active community for support and advice.

Whether you are an inventor, entrepreneur, or professional in other fields, I wish you the best of luck on your innovation journey.

If you have found this book useful and want to find out more information related to the contents of this book, please consider becoming a member of my website at [www.ip-lawyer-tools.com](http://www.ip-lawyer-tools.com).

## About the Author

Hello, I am Martin Schweiger and I am a patent attorney.

Actually, it was never my life plan to become a patent attorney. I started out as an explorer and inventor myself. I created a lot of inventions and have sold inventions like foldable kitchen scales and sensors for robot arms. I have also set up a number of businesses, some by myself and some with partners. My first business was a tuition ring at the age of 14, and after that I have always had businesses along the way, many but not all in the area of services. My most successful business has been my own IP law firm, Schweiger & Partners. The work in my firm is all about standardization and automation, which requires a lot of creativity.

I became a patent attorney only because there was a recession in 1993 in Germany and also worldwide. During that recession, it was impossible even for a young but overqualified engineer with a Master's Degree in Engineering and five working languages to find a job. I had been offered two scholarships for a Ph.D. program, one in Montréal (Canada) and one in Grenoble (France). For a short stint of three months, I tested the sweet life of an academic at the Université Joseph Fourier at Grenoble, but soon discovered that it was not my cup of tea. So I enrolled in law school and became a patent attorney. Ultimately, that was the most direct way to create my own serious business.

That was almost 30 years ago. Since then, I have personally drafted more than 500 patent applications, supervised in my IP law firm the drafting and filing of about 18,000 patents, 4,000 trademarks, and worked for all sorts of multinational companies like Siemens, General Motors, Infineon, Airbus, Opel, IBM, and Lenovo, just to name a few. My IP law firm has offices in Munich and Singapore, and if there is a big German MNC in either of these two cities, we probably have worked for them. I lead a team of about 30 people, and over the 25 years of the firm's history, we have achieved more than one hundred million dollars in cumulative revenue.

Five years ago, on my 50th birthday, I sat down and contemplated what I was going to do with my life. From then onwards, I decided that my remaining lifetime would be used for a more important purpose, and that I would make a transition from seeking success to seeking significance. I decided to find out what makes a business successful, in order to leave a legacy for all creative and innovative people who want to become successful business people themselves. That led me to read clinical psychology at the University of Toronto (Canada), and to study all the scholarly articles about entrepreneurship that I could get hold of.

So here I am, with my multiple hats as engineer, inventor, patent attorney, businessman, and also amateur psychologist and thinker about entrepreneurship and innovation. My life path as a teacher, trainer and guide is becoming clearer every day. It is my sincerest hope that the fruit of all my knowledge, experience and wisdom will help you in realizing your own calling.

## **About Schweiger & Partners**

Schweiger & Partners is a specialized Patents and Trademarks firm with offices in Singapore and Germany.

Unlike traditional legal firms who struggle with profitability in an age of automation, we are on a sharp growth trajectory.

We think and act differently. We are hyper-focused on creating client value through productizing solutions, implementing highly efficient attributive marketing, and analyzing data and metrics across the end-to-end client cycle for business insights.

Our business success has been validated by recommendations from clients and peers. Twice in a row for 2019 and 2020, the Financial Times Europe declared us to be one of Europe's leading patent law firms, with five medals in the engineering, software and materials science disciplines.

Because of our disruptive business practices and unique visionary culture, we are ready to thrive in a rapidly changing legal industry.

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Martin Schweiger